THE

JOURNAL OF GAS LIGHTING.

PUBLISHED MONTHLY.

No. 73, Vol. IV.] LONDON, FEBRUARY 10, 1855. [Price 1s., In America 30 Cents.

TO GAS COMPANIES.

BOGHEAD CANNEL COAL.—This is the most highly bituminous coal known, and, therefore, peculiarly adapted for mixing with inferior coals in the Manufacture of Gas, for which purpose it is exclusively used. One ton of it yields 13,500 cubic feet of gas, of the specific gravity of ·775; and a burner consuming at the rate of 1 cubic foot per hour, gives a light equal to 8½ spermaceti candles, each consuming 120 grains of sperm per hour. The light yielded by one ton of this coal is equal to that from 1990 lbs. of sperm candles; whereas that from the same quantity of Newcastle Caking Coal is only equal to 420 lbs.; and that from the best Wigan Cannel Coal is only 750 lbs. of sperm candles. It can be shipped at any of the ports in the Frith of Forth or the Clyde.

For terms and other particulars apply to

R. W. Kennard and Co.,
Sole Agents,
67, Upper Thames-street, London

INSPECTOR WANTED.

THE Equitable Gas Light Company are in want of an Active, Energetic, and Business Man who has had experience in the above capacity.—As the most rigid inquiry will be made into the character and habits of the person appointed, it is desired that no one will apply unless his character will bear the test of such inquiry.—Address, The Secretary, Equitable Gas Company, 21, John-street, Adelphi, London.

No personal application will be attended to.

TO GAS COMPANIES.

TO be Disposed of, a Gasholder, in excellent working condition, 61 feet diameter, 22 feet deep; with 6 Guide Columns and Frame, Guide Rollers in Sliding Carriages, &c. &c. The Holder is fitted with a Lute Joint at the bottom, so that it can be used for a Telescope Holder. The Holder has only been at work a few years, and is being removed to make room for a larger one. It is daily filled to 60,000 feet, and can be inspected on application at the Works.

E. Goddard, Engineer to the Company.

Ipswich, Feb. 6, 1855.

TO GASHOLDER-MAKERS AND IRONFOUNDERS.

THE Directors of the Faversham Gaslight and Coke Company are desirous of receiving TENDERS for the Erection of New GASHOLDER, Cast-iron TANK, GOVERNOR, &c.

Plans and Specifications may be seen on and after Feb. 6, at the Manager's Office, Gas Works, Faversham, Kent.

Tenders to be sent, on or before the 15th inst., to the Engineer, Mr. Jabez Church, Chelmsford.

Jan. 31, 1855.

TO GAS COMPANIES AND OTHERS.

FOR Sale at the London Gas Com-pany's Works, Vauxhall, a number of D Retort, Mouth-pieces, 12½ by 12½, with lids; 4-inch Ascension and Bridge Pipes to suit. All in good condition.—Apply to the Engineer at the Works Vauxhall.

COWEN'S PATENT FIRE CLAY RETORTS.

JOS. COWEN and CO.,

BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,

Were the only parties to whom a Prize Medal was awarded at the Great Exhibition of 1851, for "Gas Retorts and other Objects in Fire Clay."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.

Also, owners of Blaydon Burn Colliery, from which "Cowen's Cannel Coal," extensively used in Metropolitan and other Gas Works, and "Cowen's Garesfield Coal," are obtained. From the latter, "Cowen's Garesfield Coke" is made, the superior quality of which is well known.

Coal and Coke Office, Quay-side, Newcastle-on-Tyne.

PATENT IRON TUBES AND FITTINGS, OF ALL KINDS AND SIZES, FOR GAS, STEAM, AND WATER.

LAP-WELDED FLUES FOR BOILERS.

GALVANIZED TUBES, SHEET-IRON, &C.

JOHN RUSSELL AND CO.,

CHURCH-HILL, WEDNESBURY,

Tubing Manufacturers from the Commencement of Lighting by Gas, and previously Contractors with the Government and East India Company for Gun Barrels, which were also first supplied by them to Gas Companies, and used for the distribution of gas.

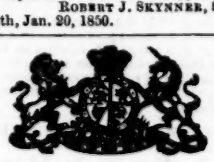
LONDON ESTABLISHMENT,
69, UPPER THAMES-STREET.

N.B. Every Tube is proved by Hydraulic Pressure before leaving the Works.

WANTED, by the Monmouth Gas and Water Works Company, a Working Manager, of Steady and Active Habits. He must thoroughly understand Gas-Making, Fittings, Meters, Laying of Main and Service Pipes, and the working of a Steam-engine. House on the Works, with Gas and Coal free.

Applications, in own handwriting, with Testimonials and Salary expected, to be addressed, prior to Feb. 20, to Robert J. Skynner, Secretary.

Monmouth, Jan. 20, 1850.



CANNEL COAL.

RAMSAY'S NEWCASTLE CANNEL was discovered by the Advertiser in 1818. Cannel Coal was then little used in London: after surmounting much opposition, it has become the principal Cannel Coal used in the Metropolis, and has greatly assisted in improving the London gas. Its joint products of gas of high illuminating power, and coke of good quality, make it one of the most economical coals known. It is used by all the London Gas Companies, as well as by many Provincial and Foreign. The Crystal Palace was lighted from it in 1851, and the Post-office, Bank, and *Times* Office, are at present.

FIRE-CLAY RETORTS.

FIRE-BRICKS of all descriptions. Manufactory established in 1804.

RAMSAY'S GARESFIELD COAL and COKE.

Bone and Artificial Manures of all kinds.

Address G. H. Ramsay, Offices, Broad-chase, Newcastle-on-Tyne.

April 27, 1854.

TO GASFITTERS, &c.

WANTED, a Steady, Active Man, who is thoroughly and practically acquainted with the Gasfitting Department, and Repairing of Meters, and who would make himself generally useful. If he has been used to common painter's work, it will be an advantage. Satisfactory Testimonials, as to Experience, Ability, and Character, will be required. Applications, stating the amount of Wages required, to be addressed to Mr. A. Atkinson, Beverley, Yorkshire.

IMPORTANT TO GAS COMPANIES.

WASHED COAL for GAS MAKING. From Experiments lately made on a very large scale, the Advertiser has proved that more Gas can be obtained from a Ton of Washed Small Coal (slack), and of a better quality than from a Ton of Round or Best Coal, particularly in districts where the coal is of a second-rate quality. All the pyrites and strange matter mechanically combined being effectually removed from the slack, the process of purification is also rendered much cheaper and easier, and the Coke produced therefrom is almost entirely free from Slag. Coal-Washing Machines, constructed to be worked by One Man, and wash Ten Tons of Slack per *diem*, have now been extensively in use for Three years in the County of Cumberland. Gas Companies desirous of reducing their Coal Bills might use these Machines to a very great advantage on their premises. The total expense of washing a ton of the foulest Slack does not exceed 4d., and the cost of a Machine extremely moderate.

All particulars furnished on application to Mr. Preston Lumb, 33, Beaufort-street, King's-road, Chelsea.

EIGHTON MOOR GAS COALS.—Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. Matthew Nesbit, Eighton Moor Office, Newcastle-upon-Tyne. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

JAMES RUSSELL AND SONS,

WEDNESBURY, STAFFORDSHIRE, and 81, UPPER GROUND STREET, BLACKFRIARS, LONDON.

PATENTEES, INVENTORS, AND FIRST MAKERS OF

WROUGHT-IRON GAS TUBING,

commencing from the *earliest* introduction of Gas Lighting into this country.

Manufacturers of every size and description of Wrought-iron Tubes and Fittings, from one-eighth up to seven-inch internal diameter, for Gas, Steam, or Water.

PATENTEES AND MANUFACTURERS OF THE

LAP-WELDED FLUES,

for Marine, Locomotive, and Stationary Boilers.

Inventors and Manufacturers of

IMPROVED STEAM AND GAS COCKS,

in Iron or Gun Metal, from three-eighths to six-inch bore. Manufacturers of every description of hand-screwing

STOCKS, DIES, AND TAPS,

for Gasfitters and Engineering purposes.

Manufacturers of Coils, for hot water and other purposes; Casing of all sizes, with flush joints, for Well-sinkers; Blasting Tubes; Buffer Tubes for Railway Carriages; Tubes for Roller Beams; Spindles, Shafts, Pendulums, Hydraulic Presses, Core Bars, Steam Gauges, &c. &c.

James Russell and Sons beg to call the attention of Engineers, Builders, Water Companies, and others, to their

PATENT ENAMELLED TUBES,

which preserve water or other liquids conveyed by them in a perfectly limpid condition; whilst the Enamel itself is as pure as the finest Porcelain, possessing the rare recommendation of being entirely free from any noxious ingredient in its composition.

Lists, Estimates, &c. &c., forwarded on application; orders, from 10 to 100,000 feet of gas tube, executed at twelve hours' notice if required; and quality may be safely relied upon, as all goods are most carefully tested before leaving the Works.

James Russell and Sons have great pleasure in calling attention to the annexed award:—

"EXHIBITION OF THE INDUSTRY OF ALL NATIONS, NEW YORK.

"Office: No. 6, Charing-cross, London, April 6, 1854.

"Gentlemen,—I have much pleasure in informing you that the Jury has awarded to your firm 'Honourable mention for Lap-welded Iron Tubes.' You are at full liberty, if you deem it likely to promote your mercantile advantage, to affix to these articles, during the season 1854, a card whereon this Award is printed, and also your prices, with name of agent, &c.—I am, gentlemen, your obedient servant,

"John H. Bonn, Secretary.

"Messrs. James Russell and Sons, Wednesbury, Staffordshire."

WILLIAM PARKINSON & CO.

(*Successors to the late Samuel Crosley*),

COTTAGE-LANE, CITY-ROAD, LONDON,

Beg most respectfully to announce that, in addition to the continued manufacture of GAS METERS, they manufacture Meters for measuring Water, Spirits, &c. (commenced under Patent, in 1849, by the late Mr. William Parkinson).

N.B. These Meters are as simple and durable as the Gas Meter, and as correct as that instrument under the most careful manipulation.

PHŒNIX Gas Light and Coke COMPANY.—NOTICE is hereby given, that the Adjourned Half-yearly General Meeting of Proprietors, holding previous to Dec. 1st last Five Shares and upwards in the said Company, will be held pursuant to the Act of Incorporation, on WEDNESDAY, the 28th inst., at Twelve for One o'clock, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring a Dividend to Christmas last; to elect Directors and Auditors for the ensuing year; and on other business.

And Notice is hereby further given, that the said Adjourned Half-yearly General Meeting will be made a Special General Meeting, for the purpose of submitting for the consideration and approval of the Proprietors a bill now in Parliament, the objects of which are to alter the Districts within which this Company, the South Metropolitan, the London, and the Surrey Consumers' Gas Companies may supply Gas within the Counties of Surrey and Kent.

Any Proprietor desirous of being represented at the said Special General Meeting by Proxy, may sign the form (previously stamped with a 2s. 6d. Stamp) and forward the same to a registered Proprietor, whom he may select; but care should be taken that the latter Proprietor only holds one other Proxy, as each Proprietor can only hold two Proxies.

By order of the Court of Directors,
CHARLES PRIDDEN, Secretary.

70, Bankside, Southwark, Feb. 1, 1855.

The Dividend to be declared at the above Meeting will be clear of income-tax, and will be payable immediately after the business of the Meeting has terminated; and afterwards at the Company's Office, at Bankside, from Thursday, the 1st of March, to Tuesday, the 6th of March, both inclusive, from the hour of Twelve till Three, and from that time on Wednesdays only, from Two till Four o'clock.

BIRTLEY IRON WORKS,

CHESTER-LE-STREET,
DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 67, Mark-lane.

WHITEHOUSE and CO.,

GLOBE PATENT TUBE WORKS,
WEDNESBURY,

Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

LESMAHAGO GAS COAL.

JAMES FERGUSON, Lessee of the

Auchinheath Gas Coal-field (the most extensive and valuable in the parish of Lesmahago), respectfully intimates to the Managers of Gas Works and Consumers of Gas Coal, that he is prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson, Gas Coal Works, Lesmahago; or J. H. Jones, 1, Poets'-corner, Westminster, sole Agent for London.

JOSEPH LAMB and CO.,

WALLBOTTLE COLLIERY,
NEAR NEWCASTLE-UPON-TYNE,

Manufacturers of FIRE CLAY RETORTS of all dimensions; FIRE BRICKS; and every other article in Fire Clay.

Also owners of HOLYWELL MAIN GAS COAL.

TO GAS COMPANIES.

NEW PELTON MAIN GAS COAL.

Parties wanting a supply of these first-class GAS COALS, which are extensively used in the London and other gas works, will please to apply to Mr. JAMES JOICEY, Newcastle-upon-Tyne.

PATENT SANITARY GAS SHADES.

These Shades, manufactured exclusively by RICE HARRIS, and SON, on an entirely new principle, effectually destroy the effluvia and smoke, and diminish the heat, which have hitherto made the use of gas so objectionable in dwelling-houses and offices, where cleanliness, freedom from smell, and a cool atmosphere, are of importance. They are simple and inexpensive, and may be had at the Works, in a variety of forms adapted to the style of fittings or the taste of the purchaser.

ISLINGTON GLASS AND ALKALI WORKS,
BIRMINGHAM;
and 1, THREE KING-COURT, LOMBARD-STREET, LONDON.

May 27, 1854.

TO MAIN-LAYERS.

WANTED, a First-Rate Hand in

the above Branch. Apply (by letter only) to G. B., at the Office of this JOURNAL.

TO IRONFOUNDERS AND OTHERS.

THE Directors of the Hastings and

ST. LEONARD'S GAS COMPANY are prepared to receive TENDERS for the Supply and Delivery of the undermentioned Pipes and Castings, viz.:—

367 lengths of 12-in. Socket-pipe, 9 feet long, of approved pattern. No pipe shall weigh more than 5 cwt. 3 qrs.; and any pipe which may be delivered weighing less than 5 cwt. 1 qr. will be liable to be rejected.

1 12-in T-piece, with 6-in. outlet.
1 12-in. do. 10-in. do.
3 12-in. Socket Bends.
1 12-in. do. Spring.

The Pipes are to be perfectly cylindrical inside and outside, of an equal thickness all round, and must be proved with a pressure equal to a column of water 250 feet high, and while under that pressure must resist smart blows of a 4 lb. hammer. The weight of each Pipe is to be distinctly marked upon it with white paint.

The whole are to be delivered on or before May 15 next, at the Hastings West Stade, or at the Hastings Railway Station, at the Contractor's option, under a penalty, in case of default, of One Pound per day for every day which may elapse from the said 15th day of May next, till the day when the whole of the goods are delivered. Payment will be made in cash in 14 days after their complete delivery.

The Tenders are to be at per ton, and must be delivered at the Office of W. B. Young, Esq., Secretary of the Gas Company, Hastings, on or before Friday, March 2, 1855, endorsed "Tender for Pipes, &c." The Directors do not bind themselves to accept the lowest or any tender.

Hastings, Feb. 3, 1855.

TO GAS COMPANIES, GASHOLDER MAKERS, CONTRACTORS, AND OTHERS.

TO be Disposed of by the Commercial

GAS COMPANY, LONDON, surplus Gas Machinery, consisting of Iron Gasholder Tanks, Gasholders (Single and Telescopic), Condensers of various powers, Station Meter, Governor, Hydraulic Mains, Ascension and Hydraulic Pipes, with various connections.

Particulars of the above may be obtained on application to Mr. Robert Jones, the Company's Engineer, at the Company's Offices, Stepney, between the hours of Ten and Four.

TENDERS for the above, or any portion thereof, will be received not later than THURSDAY, the 1st of March next. The Company is not bound to accept any Tender. Tenders to be addressed to the Secretary, and endorsed "Tender for Gas Machinery."

GEO. JAQUES, Secretary.

Stepney, 8th February, 1855.

BATTEL GAS WORKS.

To be LET, on Lease for Seven years, by TENDER, from the 25th of March next, the Gasometer, Coal-sheds, Yards, and Premises, of the above Works. The same, being situate in the immediate vicinity of the Railway Station, afford great convenience for obtaining Coals, and are well adapted for carrying on an extensive business in the Coal Trade, which has been established on the premises for the last fourteen years. The Tenant will be required to provide two approved Sureties for Payment of the Rent and Performance of the Covenants of the Lease, and to take by Valuation the usual Tenant's Inventory, which will probably amount to about £150, particulars of which may be obtained of Messrs. ELLMAN and WHITMARSH, Solicitors, BATTEL.

Sealed Tenders, with the names of two Sureties, to be sent to Messrs. Ellman and Whitmarsh, on or before the 23rd day of Feburary next, marked on the outside "Tender for Gas Works." The Company reserve to themselves the right of rejecting any Tender. To view the Works, apply to Mr. WILLIAM WELLER, BATTEL, the present Tenant.

TO GAS AND WATER COMPANIES, CONTRACTORS, &c.

FOR Sale, Five Bends, 14-in. Bore;

Four 13-in. and Four 12-in. Spigot and Socket Ends, each 8 feet long, with a radius of 5 feet, clean and sound Castings, and have not been used. Each of the 13-in. and 14-in. Bends will weigh about 9½ cwt.; those of 12-in. about 7¼ cwt.—Apply to

W. ESSON, Engineer.

Gas Company's Office, Cheltenham, Jan. 13, 1855.

ANDERSON'S
DOUBLE-ACTING PISTON EXHAUSTER

is the most simple and effective machine of the kind made. It gives no appreciable oscillation or slip; works with extremely little friction; and requires no internal lubrication.

These Exhausters are in operation both in London and the Provinces, pumping from 10,000 to 70,000 cubic feet of gas per hour. They occupy very little space, and may be set either perpendicular or horizontal.

Particulars of price, &c., may be had on application to Mr. ANDERSON, at the Gas Works, Rotherhithe LONDON.

NO CHIMNEY IS WANTED FOR

CHARLES RICKETS'
PATENT CALORIFIC GAS STOVES.

In Churches, Chapels, Halls, Shops, and for Conservatories, or any close apartments, a pipe can be attached to convey away the burnt air. These highly-approved Stoves are used at her Majesty's Mint, Colonial Office, Bristol Cathedral, Tewkesbury Abbey, and many other Churches, Chapels, &c., in all parts of England.

Liberal Discounts to the Trade.

Manufactory, Agar-street, Strand, facing Charing-cross Hospital.

NEW INSTRUMENTS for the
USE OF GAS COMPANIES.

THOMPSON'S BROMINE TEST.

APPARATUS, INCLUDING GRADUATED TUBE AND EQUALISING CYLINDER, £1. 1s.

Bromine, 3s. per ounce.

AN APPARATUS FOR TESTING THE PRESENCE OF BISULPHURET OF CARBON IN GAS.

It has frequently been remarked by chemists that even when the acetate of lead test is applied to coal gas, and indicates perfect freedom from sulphuretted hydrogen, indications are still given during its combustion which would lead to the supposition that some other compound of sulphur exists in it. The above instrument affords positive proof that this is the case, and leaves little doubt that that compound is sulphuret of carbon. This test will detect the presence of sulphur in whatever form it may exist, and is much more delicate than the acetate of lead test, even for sulphuretted hydrogen.

Cost of apparatus, £2. 2s.

A REGISTERING PRESSURE GAUGE.

It is important to gas companies to know the pressure at various parts of their districts during the successive hours of the night, for the better regulation of their initial pressure at the Works. This compact apparatus, capable of being placed in a space of less than one foot cube, is intended to supply this information. Price £7. 10s.

Station Meters, Pressure Gauges, Photometers, Specific Gravity Apparatus, &c.

CONSUMERS' METERS

at the List price, with a liberal discount to wholesale purchasers.

ALEXANDER WRIGHT,
GAS ENGINEER,
55, MILLBANK-STREET, WESTMINSTER.

TO GAS COMPANIES.

THE BRYMBO COMPANY,

NEAR WREXHAM,

Manufacture Cold Blast Retorts and Pipes of a very superior quality, and also ship good Gas and Steam Coals at Saltney, on the River Dee, and at Birkenhead.

Brymbo Iron Works and Colliery, North Wales.

London agent, Mr. J. W. Grazebrook, 75, Old Broad-street.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

GAS Cooking Apparatus, Gas Baths,

GAS HEATING STOVES, &c.

These apparatus have been very extensively introduced, and arrangements are now completed whereby orders can be executed with the utmost promptitude.

HALDANE AND RAE,
No. 2, George-street, and No. 5, Old Physic-gardens,
EDINBURGH.

Particulars may be had on application.

WHITWELL PRIMROSE GAS

COAL.—These excellent Gas Coals are wrought from the HUTTON SEAM *only*, and can be shipped either at the South Dock, SUNDERLAND; or Old Harbour, HARTLEPOOL; or Brandling Drops, SOUTH SHIELDS; on application to the WHITWELL COAL COMPANY, Sunderland.

ADDISON POTTER,

WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay Goods.

PATENT FIRE-CLAY RETORTS.—

O. BROTHERS and COMPANY, Manufacturers of O. Brothers's Patent, beg to state that these Retorts, being made in one entire operation, and in one piece, of any required shape, length, breadth, and height, are not liable to cracks and fissures, of which there is a just and general complaint; and consequently superior to, and cheaper than, any hitherto manufactured.

GREAT REDUCTION IN PRICES—30 per cent. cheaper than any other Clay Retorts manufactured.

Shape.	Sizes.	Length.	Thickness.	Price at Railway Station, Blackburn.	Price per foot run, of any required length, at Blackburn.
		feet.	in.	£ s. d.	s. d.
Dee.....	12 in. by 12 in.	8	2½	2 0 0	5 0
,, ...	14 in. by 12 in.	8	2½	2 8 0	6 0
,, ...	16 in. by 13 in.	8	2½	2 12 0	6 6
,, ...	18 in. by 14 in.	8	2½	3 0 0	7 6
,, ...	19 in. by 13 in.	8	2½	3 0 0	7 6
,, ...	20 in. by 14 in.	9	3¼	3 12 0	8 0
,, ...	24 in. by 15 in.	8	2½	3 16 0	9 6
Round	15 in. by 15 in.	8	2½	2 12 0	6 6
,, ...	15 in. by 15 in.	10	2½	3 5 0	6 6
,, ...	18 in. by 18 in.	8	2½	3 4 0	8 0
Oval Retort	18 in. by 12 in.	8	2½	3 0 0	7 6

All other sizes and shapes in proportion, to order.

References and further particulars may be obtained on application to the Patentee, Gas Works, BLACKBURN.

GEORGE and SAMUEL CUTLER,

GASHOLDER MAKERS,
No. 8, WENLOCK-ROAD, CITY-ROAD,
LONDON.

Contracts for Tanks, Gasholders, Roofs, Purifiers, and all descriptions of Gas Apparatus executed on the most reasonable terms. Improved Slide Valves, Steam, and Range Boilers, and Smiths' Work, of the best materials and workmanship.

THE

JOURNAL OF GAS LIGHTING.

PUBLISHED MONTHLY.

No. 73, Vol. IV.] LONDON, FEBRUARY 10, 1855. [Price 1s., In America 30 Cents.

CONTENTS.

	PAGE
Circular to Gas Companies	21
The Persecutions of Industry	22
The Philosophy of Illumination	23
Sir B. Hall's Sanitary Legislation	24
Communicated Articles:—	
The Chemistry of Combustion	24
Examination of the Gas of the Philadelphia Gas Works	26
Correspondence:—	
Gas Tar as a Manure	27
Register of New Patents:—	
Fawcett's Apparatus for Regulating the Consumption of Gas	27
Burke and Stocker's Improvements in Metallic Tubes	28
Sudbury's Improvements in Taps and Valves	28
Provisional Protections	28
Notices of Intention to Proceed	29
Legal Intelligence:—	
Judicial Committee of Privy Council.—Lowe's Patent for Improved Methods of Supplying Gas	29
Court of Common Pleas.—The Northampton Gaslight Company *v.* Parnell and Another	29
Liverpool Court of Passage.—Jeffery and Another *v.* Flintoff	29
Miscellaneous News:—	
City of London Commission of Sewers	30
Meeting of the City of London Gas Company	30
On the Possible Density of the Luminiferous Medium	32
Salford Gas Report	33
Mr. Flintoff at Boston	35
Deputation to Sir Benjamin Hall	37
Destruction of the Brussels Theatre	37
Newhaven (Sussex)	37
Southampton	37
The Harwich Gas Works	37
Fire at the London (Vauxhall) Gas Works	37
Presentation of Testimonial to Mr. Alfred Young	37
Yule and Wilkie's Gas Exhauster	37
Share List	38
Price Current	40

NOTICES.

Subscribers who have not paid their subscriptions for 1854 are requested to remit 12s. for the entire year, or 6s. for the half-year, by Post-Office Order, payable to Thomas G. Barlow, at the Charing-cross Money Order Office.

The subscription is 10s. per annum if paid in advance, or 12s. on credit, payable in two sums of 6s. each, due in June and December of each year. All subscriptions commence from the 10th of January in each year.

Communications and orders for Advertisements to be addressed to the Editor, No. 3, Parliament-street, Westminster.

The offices of the Editor are removed from No. 32, Bucklersbury, to No. 3, Parliament-street, Westminster.

Circular to Gas Companies.

The two sanitary measures now under the consideration of Parliament contain provisions so prejudicial to the interests of gas companies, and yet so insidiously framed that they may escape notice unless the whole of the clauses of both bills are very carefully considered, in connection with their respective "interpretation" clauses. A few examples of the force of this observation will show the necessity of a combined movement on the part of gas companies and proprietors of gas works, with the view of introducing amendments for their protection.

Clause 103, of "The Public Health Bill," with regard to lighting, is as follows:—

"103. The following regulations shall be made with respect to lighting any district:—

"(1.) The local board may cause all streets and public buildings within their district to be lighted with gas:

"(2.) If there is any company within the district willing to supply such gas upon reasonable terms, the local board shall contract with such company for the supply:

"(3.) Any dispute between the local board and any company as to whether such terms as aforesaid are reasonable shall be decided by arbitration in manner hereunto provided:

"(4.) In the event of there being no such company as aforesaid willing to supply such gas, the local board may themselves supply the same:

"(5.) In such event as last aforesaid the local board may purchase or take on lease any gasworks; they may purchase any land or easement in respect of land, and do, and construct, and execute all such works as may be necessary or proper for the purpose of furnishing a supply of gas for any of the purposes herein-before mentioned, and they may carry pipes for the distribution of gas through, across, and under any turnpike road, or any street or place laid out as or intended for a street, or under any cellar or vault which may be under the pavement or carriageway of any such street or intended street:

"(6.) Whenever any local board have themselves undertaken to supply gas to their district, they may furnish the same to any private house or for any trading or manufacturing purpose:

"(7.) The expense of furnishing a supply for gas for lighting the streets and public buildings shall be paid out of the general district rate herein-after mentioned, and the expense of furnishing such supply to any private house or for any manufacturing or trading purposes shall be defrayed by gas rents to be levied on the persons requiring such supply:

"(8.) All such gas rents as aforesaid shall be paid and recovered in manner provided by the provisions of the Gasworks Clauses Act, 1847, with respect to the payment and recovery of rents for gas, and such provisions shall, for the purposes aforesaid, be incorporated with this Act:

"(9.) Any profits made by the local board by the exercise of the powers given them by this section shall be accounted for in the same manner and be applied to the same purposes in and to which the general district rate is herein-after declared to be accounted for and applicable."

These provisions are almost unobjectionable at first sight; but, on referring to the interpretation clause for the definition of the word "street," we find it "shall apply to and include any highway (not being a turnpike-road), and any road, public bridge (not being a county bridge), lane, footway, square, court, alley, passage, *whether a thoroughfare or not*. The majority of the local boards of health would consequently have the power of coercing gas companies into an unlimited extension of their mains (even upon private property) under the pressure of a threatened competition in the event of their refusal to comply with the demand.

Numerous equally flagrant, oppressive, and vexatious provisions might be pointed out in the bill, and we are very much deceived if the entire manufacturing interest of the country does not vigorously oppose several of them.

The "Nuisances Removal and Diseases Prevention Acts Consolidation and Amendment Bill" designates "any decaying or *offensive accumulation* or deposit," as a "nuisance" to be dealt with by the summary proceedings authorised by the bill; and should it ever pass with such a proviso it is incontestible that every gas work in the kingdom is liable to suspension till some means can be devised by which tar, ammoniacal liquor, and refuse lime, shall cease to be residual products of the process of gas manufacture. The facility with which evidence has been hired to obtain conviction under the "Smoke Abatement Act" of last session, ought to act as a warning to gas companies as to what they may expect should the proposed sanitary measures become laws.

A question of considerable importance has been raised in Halifax with reference to the powers granted to numerous Improvement Commissioners to lay pipes for the supply of gas to the public lamps. A statutory power of this description has been for many years vested in the Commissioners, or Town Council, of that town, which has never hitherto been acted upon; but a proposal has been lately set on foot to exercise it in favour of a projected new gas company, which, when the pipes are laid, would use them for the supply of private consumers in competition with the existing gas company. There are no precedents for such a course; and, if persisted in, it is probable the Court of Queen's Bench will be appealed to in some form to express an opinion upon its legality.

We published, last month, the reply of Dr. Letheby to the

report of Dr. Leeson and Mr. Warington, on "the oil of vitriol question;" and, as the latter gentlemen have shown a disinclination to enter into any further discussion on the matter, we presume they are satisfied with Dr. Letheby's repudiation of "the vulgar error of supposing that he actually extracted the oil of vitriol, ready formed, from the gas." Had this admission been made at the proper time, an angry controversy would have been avoided, and Mr. Lewis Thompson's assertion that "oil of vitriol" was not one of the direct products of the combustion of coal-gas in the manner in which it is consumed by the public, would have received the universal assent it now has. That oil of vitriol *may be manufactured* from those products no one has ever denied, and it is a matter to be regretted that the whole bearing of the so called modern improvements in gas making have tended largely to augment the quantity; so much so, indeed, has this been the case, that not ten or fifteen, as formerly, but upwards of sixty grains of anhydrous sulphuric acid may be manufactured from the condensed products of the combustion of 100 cubic feet of the gas now being supplied to its customers by one of the most prosperous metropolitan. companies

In another column will be found a report of some recent legal proceedings against the originator of the new gas project in Liverpool, which exposes the miserable failure of the attempt to create an exotic agitation amongst the consumers of gas in that great emporium of commerce; and it is to be hoped that its effect will be to induce the principal agent in the movement to abstain from similar uncalled for attempts to disturb the good understanding existing between the gas consumer and the gas producer.

THE PERSECUTIONS OF INDUSTRY.

In our last article upon this subject we called attention to the injustice and the unconstitutional character of Lord Palmerston's Smoke Abatement Bill; and stated that however objectionable it might be with respect to the means adopted to abate the Smoke Nuisance, it was even more so with respect to those it introduced for the purpose of regulating the trades which have lately been stigmatised by the West-end Sanitary Quacks as unhealthy or noxious. Bad as the measure is in itself, it must be the more repugnant to every honest man on account of the contemptible trickery and fraud by means of which attention was diverted from its character, and by which it was smuggled through the Legislature. The title of the Bill 16 and 17 Vict., cap. 128, is simply "An Act to Abate the Nuisance arising from the Smoke of Furnaces in the Metropolis, and from Steam-vessels above London Bridge." In the marginal references, also, nothing is inserted which could by any possibility lead to the inference that the Act was intended to apply to anything but to furnaces; and indeed there is not the slightest apparent indication on the face of the Bill that it was designed with any view to dealing with the ordinary operations of trade. The provisions, under the authority of which Mr. Bodkin has lately so greviously oppressed the manufacturing interests, are introduced in the middle of long sentences; and there is nothing, either before or after them, to induce any casual reader to suspect the nature or effect of the few words within which they are comprised. Every precaution appears to have been taken to lull suspicion, and to divert attention from the objects of the framers of the Act; and so successfully has this been done, that, whilst the manufacturers were ignorant of its real nature, a measure has been passed which places it quite within the power of the Home Secretary to ruin any trading interest he may select for persecution. The manufacturers of London must bestir themselves to secure the repeal of this most obnoxious Act, or they will infallibly be driven from their present establishments. For the future, also, it will be necessary for them to employ some Parliamentary Agent to read every Bill introduced into the Legislature. After the specimen of Old Bailey practice offered by the Smoke Abatement Bill, no confidence can be placed in the honesty of the parties employed to guide the Home Secretary in his proceedings with respect to the regulations affecting trade.

The position of the manufacturers of London at the present day is peculiarly difficult, and has been rendered almost intolerable by the capricious legislation of recent years. The Act 7 and 8 Victoria, cap. 84, which had formed the subject of careful and mature deliberation, was hailed by them as the solution of the difficulties arising from the necessity of reconciling their vested interests with the increasing requirements of our modern civilization. Many very conscientious and able men contended at the period this Act was introduced—as they do now—that the Common Law of England was sufficient to prevent any serious nuisance; but the manufacturers accepted the Act which limited their rights (in some cases to a serious extent, and in others imposed upon them new and expensive precautions in the exercise of their trades), because they flattered themselves that by so doing they would be relieved from the proverbial uncertainty of the unwritten law. Even after the Act of 1844 had been passed, clauses of a more stringent nature than those contained in it were introduced into some Local Improvement Acts (as in the case of the Bermondsey Improvement Bill of 1845), with the consent, even if not at the suggestion, of the manufacturers; because it was felt by them that the local wants were such as to require a modification of the general measure. Since that period, however, the Sanitary Intermeddlers have succeeded in tricking the Legislature into the abrogation of its own deliberate settlement of this difficult question. The Nuisance Removal and Diseases Prevention Act, the Health of Towns Bill, the Metropolitan Sewers Act, the Smoke Abatement Act, have all in their turn contributed to the burthen imposed on manufacturers, and added so much to the statutory obligations of the latter, that they positively know not—any more than do the magistrates—the precise Acts which are applicable to their cases. None of these Bills repeal antecedent measures upon the same subject, so far at least as the intention of the Legislature can be gathered from their wording; but in practice the limitations fixed by any one of them are ignored when Mr. Bodkin seeks to apply any other, so that really the agents of the Government can proceed, at their own pleasure, under the powers of the Act which arms them with the most stringent means of dealing with the particular case before them, whilst the manufacturer is left in uncertainty as to the law to which he must conform. The vagueness of this position is, perhaps, worse than any definite legislation might be, however tyrannical in its character.

The important phrase smuggled into the 16 and 17 Victoria, provides simply that "if any trade or business" be carried on "which shall occasion any noxious or offensive effluvia, or otherwise annoy the neighbourhood or inhabitants, without using the best practicable means for counteracting such annoyance," its owner or occupier shall be exposed to a fine, the nature of which we shall refer to hereafter. But who is to be the judge of what is "noxious or offensive?" Who shall decide upon the reasonableness of a complaint on the score of annoyance? At what distance do the effluvia contaminate the atmosphere so as to bring a trade within the legal liabilities of being considered to give off vapour under circumstances which should entitle the public to complain? The Act 7 and 8 Victoria specified the "noxious" trades; and it also fixed the limit of fifty yards from any dwelling-house as the distance which was likely to render them comparatively innocuous, such limit, moreover, being only compulsory after the lapse of thirty years. Latterly, however, manufacturers have been fined when the portions of their business complained of have been situated 250 yards from such dwelling-houses. Mere lads and abstract theoreticians have been allowed to influence magistrates upon the proper methods of conducting difficult processes of manufacture, while the decision of these questions of such vital importance to the well-being of the nation is left to the uncontrolled authority of a police magistrate.

There is an interpretation clause, figuring in most recent Acts of Parliament, by which "the expression, one magistrate" is made equivalent to "two justices." It seems strange, however, that the decision of questions which so seriously affect rights and property of private individuals should be left to so unsatisfactory a tribunal as a simple police court. In the first place, no lawyer of eminence would accept such a position, because the salary is not sufficient to compensate for the loss of private practice. In the second, the police magistrates are directly nominated by the Home Office, and their chances of promotion depend upon the will of the Home Secretary. Now, as the informations under the 16 and 17 Victoria are expressly provided to be laid, by the order of the Home Secretary, it is found practically that the manufacturers are in this unconstitutional position; that they are arraigned by the Government, at the expense of the nation, before one of its own servants. Far be it from us to say that the magistrates do not endeavour

to distribute even justice. Fortunately the errors of English laws have at all times been greatly counteracted by the good sense and high principle of the judges of all classes; but no man ought to be placed deliberately in a position where his interests may be opposed to his duties; still less is it consistent with justice that a decision should be required when no principles are laid down on which it should be founded. The concocters of this strange piece of legislation it is true have rendered it unnecessary to inquire deeply into the justice of complaints with respect to nuisance, for the Act is so worded, that it is hardly possible for the magistrate ever to acquit. But, be this as it may, it would be far preferable were informations under any of the recent Acts tried before more than one magistrate. In the multitude (within reasonable limits) of judges there is at least a chance of justice.

It may serve to show the animus with which the prosecutions are conducted, to state, that upon one of the manufacturers, who was recently fined, threatening to appeal, Mr. Bodkin told him, that if he did so, he (Mr. Bodkin) would cause informations to be laid against him (the manufacturer) for every day he might work his establishment pending the trial, and that proceedings would be taken for the amount of the cumulative penalties. Now, as the appeal could hardly be heard within less than twenty-one days, this threat was equivalent to an order to close the establishment. At the end of twenty-one days the fine would amount to £10,683,775. Surely the Legislature could never have contemplated such oppression.

At present our late Home Secretary has, with his usual valour against the weak, confined his proceedings under the 16 and 17 Vict. to private traders. The turn of the large companies will, however, come if they do not take some measures to procure the repeal of this most tyrannical and obnoxious Bill. Sir B. Hall does not contemplate any alteration in its respect; and if it be allowed longer to disgrace the statute-book, the various Gas Companies especially will be made to feel its effects. A collective effort should be made to call the attention of the Legislature not only to the glaring defects of this Bill; but also to the unsatisfactory state of the whole of the law of nuisances. Much valuable information on this subject would be derived from the investigation of the French law, "*Sur les etablissemens insalubres*," to which we propose to call attention in a future article, as a warning and a lesson.

THE PHILOSOPHY OF ILLUMINATION.

All things have their "philosophy," in the sense in which the term is now commonly understood—the rational application of principles to useful purposes. In this sense it is that the art of lighting shops, streets, and houses, has its philosophy, which is divisible into two branches. One of these relates to the means of obtaining, with gas or oil of a given quality and quantity, the best possible light; and the other refers to the disposition of the light so obtained, to produce the best effects. It is to the latter branch of the subject more particularly that we now wish to direct attention.

Those who recollect the plan adopted in lighting shops twenty years ago, cannot fail to perceive a vast improvement on it in the method now very extensively practised, based on the consideration of the real object for which light is employed. It might have been supposed that the least reflection on the purpose for which a shop window is lighted would have told that it is to display the goods exposed to view. But this principle was entirely disregarded; and numbers of bright lights were placed below the level of the spectator's eyes, so that the effect produced was to conceal from sight, by the blaze of illumination, the contents of the windows. It is curious to observe how blindly people will follow established usages, without considering their fitness or absurdity; and very frequently a practice, which might have had some foundation in reason at its commencement, is continued after the circumstances that gave rise to it have disappeared. Thus, that absurd former method of shop illumination, which might, on the introduction of argand lamps, have served the purpose of attracting attention, was continued long after gas lighting had made mere brightness of light no novelty, but rather painfully obtrusive to the eyes, whilst its real advantage was completely marred by that irrational arrangement. At length, however, the folly of continuing such a practice forced itself into notice, and the improvement commenced of raising the burners above the level of the eyes. The improvement thus effected directed more attention to the subject; and, the philosophy of shop-lighting having become better understood, various plans have been introduced and adopted, founded on the principle of concealing the source of illumination, and thereby increasing the apparent brightness and prominence of the objects from which the light is reflected. The gas-burners have been raised higher and higher till, in some instances, they have been placed quite out of sight, the light being radiated and reflected entirely from the top on the articles arranged below; and, more recently, it has become the practice to have gas lanterns, with reflectors, outside the windows, which throw the light on the goods ranged close to the glass. All these plans indicate that the right principle is now understood; and the gas lantern arrangement shows that it has been carried to the extreme of its applicable limits, without regard to the general effect which the disposition of light is intended to produce.

It should be borne in mind, that different classes of goods require different kinds of illumination for their effective display. During day-time, for instance, a collection of bijouterie will be seen to best advantage when reflecting the dazzling splendour of the sun; whilst the rich or delicate colours of the silk-mercer's wares would be dimmed and changed when exposed to such a glare of light. A similar distinction prevails, with greater force, in artificial illumination. The concentrated light radiating from a brilliant gas flame placed in close proximity to the objects it illumines, generally produces a more prejudicial effect than the direct rays of the sun; for the former diminishes in intensity four-fold with the distance from the point of illumination, whilst the light of the sun is everywhere equal. That law of radiation, indeed, in obedience to which the intensity of the light is inversely as the square of the distance, greatly increases the difficulty of artificial illumination, as it is impossible without a general distribution to diffuse it equally, and when the light is closely reflected the variation in intensity between one part and another is unpleasing. For jewellery, polished metallic articles, and glass, a chief beauty of which consists in their powers of reflecting and refracting light, the effect of radiation is of comparatively little consequence. The object in illuminating them should be to place the jets of flame as close as possible, taking care to screen the direct light from the eye. In the display of all goods, however, that reflect the rays diffused from every point of their surfaces, the more distant the point of illumination the better the effect, provided there is a sufficiency of light. For drapery, furniture, and all textile fabrics, no style of illumination is so pleasing as that of causing it to descend from the top entirely screened from sight; and though the stronger light thereby thrown on the upper portion of the window is a defect in such an arrangement, it is not offensive; for it must be observed that stronger rays of light striking downwards on the eye are less glaring than more feeble rays that are reflected upwards. The placing of the light in that position is, indeed, objectionable in an economical point of view, if equal brilliancy of illumination be required, for as the rays diminish in intensity in a quadruple proportion to the distance, if the window be ten feet high the rays that illumine the lowest portion will be one hundred times less powerful than those that fall on the objects that are only one foot removed from the burners. But there are many cases in which it is advisable to make brilliancy succumb to the general effect, and though that mode of illumination may be less striking, it is far more pleasing, and serves better than any other to display shawls, drapery, and all that class of articles to advantage.*

The plan of placing gas lanterns outside, is perhaps the most economical disposition of the light, as it is thus brought to bear at a short distance; and the external lanterns possess the additional advantage of avoiding damaging the goods exposed by the burning of impure gas. But that plan of lighting shops is scarcely suited to the display of other than glittering articles; and the ugly-looking projecting lanterns are destructive to the agreeable *coup d'œil*, which a well-lighted shop should present.

It is impossible to establish fixed rules for circumstances that vary so completely as the illumination of shops, which must depend in a great degree on the character of the goods,

* The windows of Messrs. Rumbell and Owen, 77 and 78, Oxford-street, present a most beautiful illustration of illumination from the ceiling. The light descends from a large "sun-burner,"—which is a modification of Gurney's Bude light-burner—and is extremely white and brilliant. It is contained within a projecting conical reflector, whitened inside. This burner, which is a Liverpool invention, is applied with admirable effect in illuminating the Philharmonic Hall in that town.

and the size and structure of the windows. Even the guiding principle of the philosophy of shop lighting—concealing the source of light—must be abandoned, when the articles exposed for sale are themselves luminous, or assist in illumination. It would, indeed, show as little philosophy in a lamp-manufacturer or a gas-fitter to hide the flames of his lamps or of his burners, as it does in a silk mercer to dazzle the eyes of passers by with the brilliancy of gas, which prevents the beauty of his wares from being seen. It may be stated generally, that the object to be obtained is to throw a brilliant, equally diffused light, over all parts of the window; carefully screening from sight the source whence the light issues. To produce this effect, it will be not only necessary to attend to the disposition of the gas burners, but also to the kind of reflectors employed, so as to avoid concentration by curvature, and to reflect the light most to the parts most distant from the flame.

The philosophy of illuminating public buildings and private houses is the same in principle as that of lighting shops, with this difference—that in an assemblage of people, those who behold the illumination are, at the same time, the principal objects to be illuminated. The guiding principle, however, of making the source of light itself unobtrusive should be observed with equal rigour as in the lighting of shops; to conceal it altogether is impracticable, excepting at an extravagant expenditure of lighting power: but the lights should be placed so high as to be not observable without looking upwards; or, in smaller or less lofty rooms, the rays should be generally diffused by passing through ground glass, or some other translucent medium.

SIR B. HALL'S SANITARY LEGISLATION.

There is no tyrant like a Liberal in power. There is no test of the sincerity of a man's principles equal in its efficacy to giving him the means of applying them. Sir B. Hall has pointed the moral of these truisms, perhaps, more forcibly than any one in modern times, accustomed as we have been to the sudden conversion of Radicals under the influence of the blandishments of place and power.

The honourable member for Marylebone was carried into office by the united outcry of those who, smarting under the centralising measures of the late General Board of Health, had adopted him as the exponent of the principle of local self government. He had barely been in office three months before he commenced an onslaught against water companies; he has, on many occasions since then interfered, with all the weight of Government, in many details of local administration with which he had not the least imaginable right to meddle; he has gone out of his way to attack, unjustly, the officers employed under the authority of local acts; he has interposed to protect the officers of the late General Board of Health from the legitimate consequences of their incapacity, as in the case of the Southampton drainage; and now he presents to the House some measures upon sanitary matters, which are, in fact, of a more centralising and dangerous character than those he was especially nominated to destroy. The French proverb says truly, "*on n'est jamais trahi que par les siens.*"

The whole scheme of Sir B. Hall's sanitary legislation can hardly yet be said to be before the public, because the third bill, for the regulation of the metropolis, has not yet been presented. There is, however, quite enough in the Nuisances Removal and Diseases Prevention Act, and in the Public Health Act, to indicate his views upon the whole question; and really it would hardly have been possible for Mr. Chadwick himself to have devised measures more objectionable than those above named. In the Nuisances Removal Bill all the vague definitions and the arbitrary powers sought to be obtained by the proposers of the measure, Sir B. Hall opposed so violently last year, are reproduced, No difference is made between accumulations of matters (so called) noxious, which are requisite for trade purposes, and those which are unnecessarily made. No qualification is requisite on the part of those who are to be empowered to set the Act in motion. The magistrates are to be armed with powers to issue prohibitions which will, in fact, be far more powerful than injunctions of the Court of Chancery, because no provision is made for a release from them. By the bill an appeal is purported to be allowed from any order of prohibition, but none is allowed against an order for abatement. Every precaution is taken to protect local authorities against loss from the operations of the act, but none is taken to protect individuals from an abuse of the powers so given. The Board of Health is to be armed with arbitrary and indefinite powers throughout England, "whenever *any* part of England *appears* to be threatened with, or affected by, any formidable epidemic;" and, to crown all, the local authorities are to be liable to fine if they should not conform to the injunctions of the Central Board of Health. All the old and contradictory legislation on the subject of nuisance, be it observed, is retained by this bill.

The Public Health Act is more objectionable still. By one of the usual Government tricks, the metropolis is not exempted from its operations, so that all the important interests of the gas and water companies which now so efficiently supply its wants are imperilled. The corporation, the commissions of sewers, of roads, or those acting under local improvement acts, are exposed to be superseded by new local boards of health. Land is to be taken compulsorily, merely with the consent of the quarter sessions. Private gardens, walks, &c. are artfully brought under the "provisions as to streets," by the interpretation clauses; every gentleman, building or altering his house, is bound to obtain the consent of the local boards of health. A new language is required to be learnt, in order to understand the meaning of the act; and whilst every measure is adopted to increase the powers, both of the general and the local boards of health, no guarantees are offered that these powers shall not be abused. Thus it is not necessary that the president should be a member of either house of Legislature. No guarantee is provided for the competence or the character of the officers of any of the boards, although Sir B. Hall's speech on the introduction of the measure must prove the necessity for the adoption of some precaution against the jobbery and incapacity he so bitterly exposed; and this, by the way, was the more remarkable, because he has retained the very men who were most affected by the accusations he himself brought. There are no provisions in the bill to prevent the contamination of streams, wells, or rivers, by the sewerage operations of the local boards of health; nor is there any definition of the reasonableness of the demands the local boards are empowered to make on gas or water companies, whilst every facilicity is given them to establish works in opposition to those companies who vainly flattered themselves that their acts of Parliament conferred upon them certain rights.

It is hardly possible to appreciate all the bearings of these acts at present, for they are so wordy and so artfully drawn, that they require a longer and more deliberate examination than we have been able yet to give them. It is, however, our duty to call the serious attention of all public companies to these insidious attempts to extend governmental centralisation, and to urge them to combine, in order to defeat measures so fraught with danger to their interests, whilst they introduce principles so fraught with evil to society in general. We understand that a meeting will shortly be called for the purpose of securing such combined action, and most earnestly do we advise all companies or persons affected to attend.

Communicated Articles.

THE CHEMISTRY OF COMBUSTION.

Among the many common things constantly occurring around us, which escape consideration from the very fact of their being common, there are few that present so many phenomena worthy of notice as the burning of a candle or a jet of gas. If we can imagine a man to have attained possession of his reasoning faculties without having seen combustion of any kind, the first time that he witnessed the burning of a stick or candle, it could not fail to strike him with the utmost wonder. The bright, conical, flickering flame shines far more brilliantly than the finest gems, throwing light on all surrounding objects; and if he brings his hand near to it, he finds that it burns. On looking at the candle attentively, he perceives that its substance is gradually wearing away—that the melted tallow is continually ascending the wick, at the top of which bubbles rise up and disappear in the middle of the flame. By what means the tallow is converted into a bright, hot, conical cap at the top of the candle, he would be altogether at a loss to conceive, and he would be eager to learn how such extraordinary effects could be produced. To those who have been accustomed to witness the action of fire from their infancy, this great marvel passes unobserved; and it requires an effort of reason to be convinced that there is really anything extraordinary in such a common thing as flame. During the last month, Professor Faraday undertook to rouse attention to this subject in a short course of lectures at the Royal Institution. In his felicitous manner, he first pointed out the nature and extent of the wonder, and then proceeded to

explain the causes that produce it. To many of our readers, no doubt, the subject is familiar; but even to them it may not be uninteresting to know how such a man as Faraday treated and illustrated the chemistry of combustion, so as to make it intelligible to an audience consisting principally of young persons; whilst, to those not so far advanced in scientific knowledge, the consideration of the nature of flame cannot fail to be usefully instructive.

A gas flame does not afford so complete an illustration of the phenomena of combustion as a burning candle, because the latter exhibits the process of making the gas as well as the chemical action in the flame itself; therefore Professor Faraday started with the examination of a lighted candle, and frequently reverted to it in the course of his lectures as a fundamental fact, which it was desirable to keep in view. The mechanical actions which take place preparatory to the actual combustion, constitute the first class of phenomena, including the melting of the wax or tallow by the heat of the flame, the formation of a cup on the top of the candle for the reception of the melted wax, and the capillary attraction by which it is drawn up the fibres of the cotton-wick to be converted into gas. The effect of capillary attraction was shown by placing short pieces of cane into a saucer containing turpentine, which rose up the pores of the plant to the height of two or three inches, and was then ignited at the top. The small bubbles observable, rising up the wick, are the vapourised hydrogen and carbon of which the candle is composed. The vapour thus introduced into the flame undergoes the same process of conversion as when oil or rosin is admitted into a red-hot retort in making olifiant gas. The interior of the flame may thus be considered as performing the offices of a retort, a gasometer, and a gas-burner; the rich gas that is generated by the heat being brought into almost instant contact with heat and air sufficient to effect its combustion. That the gas is thus formed and collected in the centre of the flame, may be proved by drawing it off as it is generated into a separate vessel, to be afterwards burned; or it may be conducted through a tube, and set on fire at a considerable distance from the flame that produces it. Both these modes of illustrating the formation of gas in the interior of flame were exhibited by Professor Faraday, by introducing, just above the wick, a small glass tube through which the gas was conducted; it being collected in a bottle in one experiment, and burnt at the orifice of the tube in another. The fact that the flame consists of a hollow cone, and that combustion takes place only on its surface, where it is in contact with the air, was also shown by the experiment of quickly introducing for an instant a piece of paper horizontally into the flame of a candle, when a ring was formed where the paper had been scorched by the flame, the inner portion remaining untouched. For the purpose of illustrating the action and directions of the currents of air during combustion, the different characters of the flame of ether were shown, when it was burned on a suspended cotton ball accessible to air all round, and when poured on to a dish. In the former case, the flame ascended vigorously to a considerable height, whilst in the latter, the effort of the air rushing in at the sides was manifest by its pushing the flame inwards, and greatly contracting the blaze. The directions of the currents of air, and of the vapours produced during combustion, were also exhibited by projecting, by electric light, the shadow of a flame on a screen.

Having described the general character of flame, Professor Faraday directed attention to its luminosity; and he proceeded to show, by a variety of experiments, that that property depends on the carbon contained in the gas, the particles of which the heat brings into a state of incandescence. The simplest illustration of the fact that the luminosity of flame is occasioned by the heating of the solid particles suspended in it, was the introduction of a piece of platinum wire into the non-luminous flame of hydrogen gas, the incandescent metal shining brightly in the midst of the scarcely visible burning gas. The dependence of luminosity on the solid particles acted on by the heat of the flame was further illustrated by directing a combined jet of hydrogen and oxygen gases—which produce intense heat without giving light—upon a small piece of lime, the result being that most brilliant illumination known as the Bude light. The influence of carbon in imparting luminosity was exhibited by collecting the smoke from burning turpentine, by means of a funnel-shaped tube, and introducing it into the flame of a spirit lamp, when the non-luminous ignited vapour became a brilliant light. That there is abundance of carbon present during luminous combustion was proved by introducing a small tube into the brightest part of a flame, where the carbon is principally consumed, the other end of the tube being inserted into the neck of a bottle, on the sides of which a thick incrustation of carbon was soon deposited. The carbon undergoes perfect combustion in a well-regulated light, by the heat of the burning hydrogen; but when the quantity of carbon vapour evolved from the combustible body is greater than the heat of the hydrogen will consume, it is given off in smoke.

The next branch of the subject which Professor Faraday proceeded to consider was the aqueous product of combustion. The extraordinary combination of fire and water in flame was noticed in a very forcible manner; and he exhibited, in several experiments, that water invariably constitutes an important result of the combustion of bodies that become vaporous before they burn. In one of these experiments, the water rising in a state of vapour from the flame of a candle was condensed on the bottom of a silver ladle, in which ice was placed to keep it cool, and the steam, as it condensed, collected in drops outside the ladle, and, falling on the wick, extinguished the flame. The aqueous product of combustion was then analysed, by passing steam through a red-hot tube containing iron turnings; and the gas collected was shown to be identical in all its properties with the hydrogen that formed the vaporous and non-luminous portion of the flame. The difference in physical properties between that light, permanently elastic gas and readily condensible steam was afterwards experimentally proved. The change which the iron had undergone during the passage of the steam through the tube was next examined; its increase of weight, by the formation of a black scaly substance that adhered to the outside, indicating that a much larger portion of the elements of the steam had been retained by the iron than had passed through the tube in the form of hydrogen gas. The nature and character of oxygen, the second elementary constituent of water, thus solidified in black scales on the iron, were then investigated by the decomposition of water by voltaic agency, by which means both elements were separately produced and collected. Oxygen gas afforded the opportunity of introducing a number of very brilliant experiments, to illustrate the important part it bears in the process of combustion; the strong affinity that subsists between the elementary constituents of combustible bodies and oxygen being, in fact, the cause of the phenomena of ordinary combustion. The greatly increased splendour with which a wax taper burns when placed in a jar of oxygen gas, the brilliancy of burning phosphorus, the beautiful scintillations of iron, the bright blue flame of sulphur, and the greatly increased action of several other combustibles when surrounded with an atmosphere of oxygen gas, were exhibited with complete success. In one of these experiments, the contrast was shown between the combustion in oxygen and in common air, by sprinkling iron filings into a flame of spirits of wine, when held over an open jar of oxygen. The sparks of the ignited iron filings that burned in the atmosphere appeared quite dim, compared with the brilliant sparks that fell into the jar of oxygen. A very striking illustration of the power of oxygen in stimulating combustion was exhibited by the burning of an iron poker. The poker, when heated to a bright cherry-red, was exposed to a jet of oxygen gas, when it immediately began to burn with a brilliant light, throwing off in all directions large ignited globules of iron, and wasting away as it was consumed as rapidly as a burning taper.

Having thus exhibited the power of oxygen in exciting and supporting combustion, Professor Faraday directed attention to the source whence the oxygen is derived in ordinary cases of combustion. The constitution of atmospheric air was examined; and it was shown, by the test of nitrous gas, to contain a large portion of oxygen. In the first instance, the peculiar action of nitrous gas on oxygen was shown by mingling two jars filled with those gases together, when a large absorption of the volume immediately took place, with the production of red vapour. A similar effect, though less intense in its action, was shown to take place on introducing nitrous gas into a vessel filled with atmospheric air. The coloured vapour was visible; and a considerable diminution of the volume of air was observable, in consequence of the oxygen it had contained having combined with the nitrous gas. The gas that remained in the vessel after the oxygen had been absorbed, was proved to be unable to support combustion, by its extinguishing a lighted taper the instant it was introduced. This residual nitrogen gas, it was stated, acts merely as as diluter of the oxygen in the atmosphere, and serves to reduce it to a state fit for the maintenance of life and vegetation; for an atmosphere of pure oxygen would prove so active a stimulant of combustion, that all combustible bodies on the surface of the earth, including the metals, would be consumed. The mechanical properties of the air were briefly explained, with a view to convey an idea of the vast weight of the aërial matter that surrounds the globe, and is ever ready to enter into combination during combustion. Professor Faraday estimated that the volume of air contained within the lecture-room of the Royal Institution would weigh one ton and a half.

The formation of carbonic acid during the process of combustion, of which it constitutes an important result, and the combination of carbon, in the brightest part of the flame, with the oxygen of the atmosphere, to form carbonic acid gas, were next considered. The great specific gravity of that gas compared with atmospheric air, and its property of extinguishing flame, were illustrated by experiments. The rapid absorption of carbonic acid by water was noticed as an instance of the admirable contrivance of Nature to maintain the surface of the earth in a fit state for the preservation of animal life. It is owing to that property that the carbonic acid generated during combustion mixes with the aqueous product of flame, and mingles generally with the atmosphere, instead of falling to the ground, as it otherwise would, and rendering the lower stratum of air unfit for respiration.

The consideration of the combustion of those solid bodies that enter into direct combination with oxygen, without previously assuming a vaporous condition, formed the last branch of Professor Faraday's subject. In the burning of charcoal, for instance, the oxygen enters directly into combination with the carbon without any previous change of state, and the product of the combustion is carbonic acid alone, without water. The most remarkable exempli-

fications of this kind of combustion were afforded by iron and lead. A piece of pure iron, prepared in a manner to facilitate its combination with the oxygen in the atmosphere, was ignited, and continued to burn with a smouldering red heat like tinder. The great combustibility of iron was shown in a still simpler manner, by mixing gunpowder and iron filings together, and then sprinkling them into the flame of spirits of wine. The iron filings took fire readily, as they dropped into the flame, but the gunpowder was not ignited until the spirit was evaporated. The ignition of prepared lead, on merely coming in contact with the atmosphere, formed a very beautiful experiment; the finely powdered lead, as it was allowed to fall, becoming ignited, and descending like sheets of fire. Professor Faraday said that lead is, next to phosphorus, the most combustible substance in nature; and the cause why it and iron do not usually take fire and burn, is owing partly to their being good conductors of heat, and also to the formation of films of their oxides, which protect the metals from the further action of the atmosphere, and thus render such very combustible bodies strong resisters of combustion.

The difference between the actions of combustion and explosion was alluded to in the conclusion of the lectures, and was stated to be attributable entirely to the comparative rapidity with which the supporter of combustion and the combustible are brought to act on each other. In the explosion of mixtures of hydrogen and oxygen gases, for instance, the combustible and the supporter of combustion are intimately mingled; and in gunpowder the saltpetre affords an ample and rapid supply of oxygen to the burning sulphur and charcoal. The phenomenon of animal heat, though not generally attributed to combustion, is so analagous to that process, that Professor Faraday said he could not conclude the lectures without noticing it; and he showed, by analysing the breath, that a quantity of carbon, the product of animal combustion, is evolved from the lungs, which in the course of twenty-four hours amounts to the weight of seven pounds.

In the preceding sketch of the manner in which Professor Faraday treated the chemistry of combustion, we have merely traced the course he pursued in developing, and the most striking experiments that served to illustrate, that interesting subject. Within six lectures it was impossible to enter into the investigation of the more recondite phenomena, and the disputed theories respecting the nature of heat, nor to examine the practical bearing of combustion in heating and lighting. The elementary branch of the subject, however, which he undertook to explain, was presented in a clear and interesting manner, and in the manipulation of the experiments he was, as usual, perfect. Professor Faraday has on several occasions lately alluded to his advanced years, and to the propriety of his resigning his position at the Royal Institution into the hands of some younger man; but the energy and animation he still displays prove most satisfactorily that his years have not yet blunted the ardour of scientific inquiry; and, if he himself feels the effects of age, they are but little apparent to his admiring auditors.

EXAMINATION OF THE GAS OF THE PHILADELPHIA GAS WORKS.

By Chas. M. Wetherill, Ph. D., M.D.

The following examination of the Philadelphia gas was made for the engineer of the works, Professor J. C. Cresson, in the beginning of the year 1852, but, unfortunately, was not completed in sufficient time to be inserted in detail in his report for that year. As the results of the examination of the gas at that time, by different operators, are at total variance, and since particular pains were taken in my examination to check its results, I have thought proper, with the permission of Professor Cresson, to offer them in full to the criticism of the scientific public. The analysis was performed with the apparatus of Bunsen, which I made and graduated with care; and following Bunsen's process and precautions, as detailed in the "Hand-woerter Book de Chemie," vol. ii., p. 1050. The course of analysis and calculation is as follows:—

The gas was tested for carbonic acid and sulphuretted hydrogen by passing through lime water and solution of acetate of lead (in one instance a direct examination for CO_2, by measurement, was made), of which, being found absent, it was dried in the small eudiometer by a chloride of calcium ball, and measured.

The olefiant gas and hydro-carbon vapours were absorbed by a coke ball saturated with a mixture of anhydrous and concentrated sulphuric acid, followed by a ball of oxide of manganese, and one of caustic potassa.

Oxygen was absorbed by a phosphorus ball by aid of heat, followed by a caustic potassa ball.

The residual gases, supposed to consist of nitrogen, light carburetted hydrogen, carbonic oxide, and hydrogen, were transferred to the large eudiometer, mixed with a known quantity of oxygen, and the absorption noted after explosion. The resulting carbonic acid having been determined by a potassa ball, the unconsumed oxygen was ascertained by exploding with a known quantity of hydrogen; and the nitrogen obtained by subtracting this oxygen from the volume left as above, by the absorption of carbonic acid.

Calling x = hydrogen,
y = light carburetted hydrogen,
z = carbonic oxide,

Calling A = the sum of combustible gases,
B = the oxygen used for their combustion,
C = the carbonic acid formed,

we have, according to Bunsen's formulæ—

$$x = A - C,$$
$$y = \frac{2B - A}{3},$$
$$z = C - \frac{(2B - A)}{3}.$$

On measuring the above results, the temperature was ascertained by an accurate centigrade thermometer by Greiner, which indicated half degrees. The mercury column in the eudiometer was subtracted from the barometric pressure, which was determined by an excellent Gay Lussac barometer, of Lerehours and Secretan, and the hydroscopic state of the gas also noted. The volumes were then reduced to 0°, and 1000 millimetres pressure, *dry*, by the formula—

$$\log. r' = \log. r + \log.(B - b - T) - \log.[1000 + \log.(1 + d\,t^{\circ})]$$

in which

r = measured volume,
r' = corrected volume,
B = barometric pressure,
b = mercury column in eudiometer,
T = tension of aqueous vapours at temperature t°, and
d = 0·003665.

The volume per centage was thus calculated:—

Experiment A.—*Gas collected in a Sealed Tube at my Laboratory, 206, Cherry-street, Jan. 26, 1852, 11¼ A.M., letting Gas run for a Quarter of an Hour before Sealing.*

	r	t°	B m. m.	b Mer. Col. in Eudiometer.	r' Vol. at 0° and 1000° m. m.
1. Original vol. (*moist*)	119·0	13°	758·8	67	77·32
2. After absorp. by potassa (*dry*)	118·0	15°	759·6	68	77·35
3. Olefiant gas absorbed ,,	109·2	14°	759·7	76	71·01
4. Oxygen absorbed by phos.,,	110·4	19°	762·6	75	70·97

The rest of the analysis lost in the subsequent explosions.

Jan. 27.—Gas passed through a solution of acetate of lead for 10 minutes; no precipitate; absence of sulphuretted hydrogen.

Passed through lime-water for half an hour, keeping a similar test-tube with lime-water alongside for comparison; no carbonic acid could be detected.

B.—Gas collected for analysis, Feb. 5, at 1½ P.M., same locality. Passed, before collecting, through solution of acetate of lead and lime-water for 10 minutes; no precipitate suffered to escape for 10 minutes before sealing its tube.

	r	t°	B. m. m.	b	r' corrected Volume.
1. Gas dried in eudiometer by Ca. Cl. ball (dry)	95·4	17°	754·3	91·2	59·556
2. Olefiant gas absorbed (dry)...	87·0	18°	763·0	98·5	54·234
3. Oxygen absorbed (dry).....	86·0	16°	766·6	100·0	54·153
4. Transferd. to large eudiom(mst.)	130·8	13°	769·2	379·0	47·332
5. After admission of oxygen(mst.)	316·9	15°	768·0	189·0	170·110
6. Explosion (moist)	210·5	16°	767·0	296·0	90 971
7. Carbonic acid absorbed (dry) .	165·5	16°	768·9	342·5	66·661
8. Hydrogen added (dry).....	456·6	16°	766·3	50·5	308·73
9. Explosion (moist).....	238·1	16°	765·8	268·5	108·82

Checks upon calculations:—

1st.—n + combustible gas = 47·332

x = 22·991
y = 21·665
z = 2·645
n = 0·031

47·332 same as above.

2nd.—Let v = combustible gases = 47·301 } = 103·449
a = oxygen consumed = 56·148 }
m = the absorption 79·139 } = 103·449
n = the carb. acid found 24·310 }
$v + a = m + n$.

B.—*Second Analysis, to Check First Analysis.*

	V	t°	B.	b	r'
1. Dried ore, Ca. Cl.....	101·8	16°	760·9	83·0	65·189
2. Olefiant gas, &c., absorbed....	94·5	16°	756·9	91·0	59·307
3. Oxygen absorbed.....	94·5	16°	754·5	91·0	59·229

The rest of the analysis lost in the explosion. The walls of the eudiometer were taken of thin glass of the size that Bunsen suggests; but, being made of flint glass, and having once injured myself by a breakage of similar glass, I made the several explosions with great circumspection, endeavouring to increase the

elasticity by not pressing the tube too hard upon the caoutchouc, by which, in the experiments lost, some of the gases were forced out of the eudiometer.

Feb. 11, 20 minutes before 11. Same locality.—Gas reacted alkaline to litmus-paper. Passed for 10 minutes through a solution of nitrate of silver; the solution became yellowish, with a slight whitish precipitate, which, on applying heat to the test-tube, became reduced to black silver, acquiring metallic lustre under the burnisher.

During the above analysis, the gas-meter at my laboratory was filled with spirits on account of the cold weather; the gas, therefore, contained a small proportion of alcohol vapours.

The errors of observation and manipulation I believe to be within one-tenth of one per cent.

The following table shows the per-centage volume of gases, according to my analysis:—

Per centage by Volume, Gases Dry, at 0° Centigrade, and 1000 Millimetres Barometer.

	A	B 1	B 2
Carbonic acid	00·000		
Olefiant gas and hydro-carbon vapours	8·157	8·963	9·023
Oxygen	0·052	0·136	0·120
Hydrogen		44·168	
Light carburetted hydrogen		41·620	
Carbonic oxide		5·081	
Nitrogen		0·059	
		100·000	

With regard to the small amount of nitrogen, I would call attention to the fact that Bunsen and Playfair have shown the quantity of nitrogen in gas from coal to be exceedingly small in quantity; their results gave a per centage of 0·01 of this gas.

It was intended that I should have instituted comparative analyses of Philadelphia and New York gas, for which purpose there were given me three sealed tubes—one of Philadelphia gas, the other two from New York. On examining the sealed ends of these tubes with a microscope, very small holes were noticed in two of them, rendering an analysis useless, since diffusion must have taken place; the remaining tube was so thin at its closed end that the warmth of the hand in examining it exploded the tube.

The following are the results obtained by Professors Booth and Faber, Stewart and Alexander, of which the full details are not given. The first two chemists performed their analysis according to Bunsen's process, using an accurate German thermometer, and a French aneroid barometer, indicating, according to a comparison with an ordinary mercurial barometer, 0·01 of an inch; their report is dated Dec. 30, 1851.

Professors Alexander and Stewart examined New York gas (from the Manhattan Company), collected in the New York Hotel, in the forenoon of Jan. 2, 1852; and Philadelphia gas, collected by Professor Booth from a burner in his laboratory, in the forenoon of Jan. 1, 1852. The hydro-carbons were absorbed by chlorine water in the dark, and which, the analysts say, appear slightly in excess from the vapour of naphtha accompanying the potassium used as one of the reagents. The following table of correct measurements, corrected for 30 inches barometer, and 32° Fahr., is given in Professors Stewart and Alexander's report:—

	Manhattan Gas.		Philadelphia Gas.
Carbonic acid	0·0222		0·0087
Hydro-carbons	0·0928		0·0996
Olefiant gas	0·0344		0·0204
Light carburetted hydrogen	8·7089		0·3227
Hydrogen			0·4049
Nitrogen	0·1231		0·1461
	0·9814		1·0024

The gas volumes of these different chemists are reduced to 32° Fahr., and barometric pressure 30 inches (about 762 millimetres).

Volume per Centage.

	Profs. Booth and Faber.		Profs. Alexander and Stewart.	
	N. Y. Gas.	Phil. Gas.	Manhattan Gas.	Philad. Gas.
Olefiant gas	8·32	6·38	3·50 } 12·95	2·04 } 11·17
Hydro-carbon			9·45 }	9·93 }
Marsh gas	32·92	54·84	*32·04	32·20
Hydrogen	24·04	26·27	*40·20	40·39
Carbonic oxide	11·60	4·42		
Carbonic acid	2·10	0·97	2·27	0·87
Oxygen	0·19	0·04		
Nitrogen	20·83	7·08	12·54	14·57
	100·00	100·00	100·00	100·00

As will be seen by a comparison of these results with each other, and with my own, there is no agreement at all between them. Perhaps a publication of the details of the above-mentioned analyses would bring order out of apparent confusion. It is always well to publish details, for not only do they afford sometimes the only means of criticism, but are useful in preserving records of analyses from being lost, when, from some newly observed fact, a recalculation from the original *data* is necessary.

* Not separated experimentally, but their proportions calculated in the same ratio as in the Philadelphia gas.

Correspondence.

GAS TAR AS A MANURE.

Sir,—In the former letter I addressed to you, I pointed out the value of gas tar as an antiseptic manure; I now wish to lay before your readers some observations on its use as a preventative to cholera, as an asphalt, and to draw attention to its sanitary utility when put into cesspools and drains, deduced from my own recent experience.

Dr. Mitchell of Trinidad, in a letter to the *Times*, has communicated some remarkable facts relative to the visitation of cholera in the land. Nearly the whole of it suffered, but the swampy and febrile districts were generally last attacked, and suffered least. One place alone escaped entirely—the district of the "Pitch Lake," although inhabited by a poor population—the above district, La Brea, being, generally speaking, insalubrious, affecting the inhabitants with intermittent and remittent fevers. In the town of San Fernando, where a large quantity of asphaltum had been thrown under and around a house, the inhabitants of that house alone escaped the cholera. No case occurred in the badly ventilated cells of the prison at Fernando, which were floored with asphaltum. Now, as naphtha is present in coal tar as well as in asphaltum, and as its curative virtue in Asiatic cholera was verified by Dr. Andreosky, physician to the commander-in-chief of the Russian army in Circassia—a notice to that effect having appeared in the *Pharmaceutical Journal* for July, 1848—I am led to infer from the above facts that naphtha must, from its antiseptic properties, destroy putrative matters, and neutralise the pernicious fermentation of vegetable food in the stomach, caused by inhaling "ozone" from the atmosphere, and supposed to originate cholera. *Oxygen* explodes naphtha by the mere heat of the sun. Naphtha combines in all proportions with strong alcohol, ether, and oils, and it dissolves sulphur, phosphorus, &c., "It does not unite with water. Creosote is obtained from tar: and Dr. Cormack, in his Treatise, Edin., 1836, brought forward many facts and arguments to prove that the Egyptian mummies owed their preservation and medical virtues to creosote." Tar obtained from wood has been used for medicinal purposes from the most ancient times, and within recent dates has been strongly advocated by different persons.

To test the disinfecting properties of coal tar, I have had three cesspools emptied, the sewerage of them being diluted with one gallon of tar to about 120 or 150 gallons of the water. One of the cesspools contained 1000 gallons of sewerage from the water closet, and the effect was to render it so completely inodorous, that neither could I or those employed perceive any smell of the water when very close to it.

Mr. Reed's letter, inserted in the last Journal, corroborates my statement as to the value of gas tar as a manure. Considering the value of sewerage water and tar, I have had the mixture applied to all my peach, apple, gooseberry, and currant trees, and to a small plot of grass land. I would suggest that different boards of health should adopt the plan I now point out, for the conversion of the sewerage of towns into a profitable manure, by its dilution with coal tar. The process, so far from being prejudicial to the public health, would be beneficial to it. The disinfectant properties of the tar not only neutralise the noxious gases emanating from the sewerage, but give out those volatile properties advantageous to health in a vitiated atmosphere. John Malam.

Holmpton Lodge, Jan. 19, 1855.

P.S.—Since the foregoing experiments were made, I have found that the naphtha, &c., of the tar, in combining with the sulphuretted and phosphuretted hydrogen gases, leaves a black sediment at the bottom of the cesspools like coal dust, which no doubt may be similar in nature to the carbonaceous powder named in Mr. Reed's letter. In consequence of the large quantity of ammonia present in the drainage water from the cowshed, I find the tar does not so readily combine with it as it does with the sewerage water. Dr. Ure estimates the available amount of volatile and fixed matters of coal in the following order:—

	Naphtha.		Dead Oil.		Pitch.
Common coal tar	3	....	62	....	35
Ordinary cannel tar	9	....	60	....	31
Boghead cannel tar	15	....	67	....	18

The naphtha and dead oil of tar, when the latter is made to trickle out of suspended barrels into a mass of coals, become absorbed, and the tar disappears.

Register of New Patents.

No. 1677.—John Fawcett, of Gateshead, Durham, chemist, for "*An apparatus for regulating and economising the consumption of gas generally, but more particularly when employed for the purpose of*

illumination." Dated July 22, 1854. (Provisional protection only obtained).

This invention consists in adapting to gas burners, or jets of every denomination, a ready means of adjusting the area of the opening through which the gas passes; and this invention is designed for the purpose of enabling the proprietors of either public or private establishments to prevent their domestics from using gas extravagantly; and an important feature in this invention consists in regulating the gas at the burner instead of at the meter, as heretofore generally practised; and further, in so constructing the burner that when it is adjusted it cannot be altered by any other person than that which has the proper instrument for the purpose; and there is an index-hand attached to the burner, for the purpose of ascertaining whether the apparatus has been tampered with.

The nature of this invention will, however, be better understood by the following description of the construction of the apparatus which is employed for effecting the above objects; that is to say, in addition to the cock of the burner, as ordinarily employed for the purpose of turning the gas on and off at the burner, another cock of the following construction is employed. That is to say, the seat of the last-mentioned cock is formed with a long collar or neck, and a separate piece or key, which passes into the said collar, and fits upon a piece fixed to or formed upon the large end of the plug, and to the opposite end of the said plug, one end of a hand or indicator is fixed, the other and opposite end of which hand traverses over a dial-plate fixed to the seat of the cock; so that upon observing the position of the hand upon the said dial, when the cock is adjusted, any attempt to alter the position of the cock by any other instrument than the one designed for that purpose, will be indicated upon the dial.

No. 1672.—Edmund Burke, of Upper Thames-street, City, gent.; and Alexander Southwood Stocker, of the Poultry, City, London, manufacturer, for "*Certain improvements in the manufacture of metallic tubes and such like articles.* Patent dated Oct. 14, 1854.

These improvements consist in the application of a thin sheet of metal coiled, wound, or lapped more than once around a suitable core, mandril, or mould; or the forming of one layer or series over another, to produce a tube or other such like article, or hollow structure, the layers of which may afterward be massed, consolidated, or soldered together.

Thus, for instance, in the making of an iron gas-tube or a water-pipe, a sheet or sheets of iron is wound, coiled, or laid around a suitable mandril, of a size corresponding with the bore; and when the sheet or sheets of metal have been properly wound and secured, the mandril is withdrawn, and the tube in this state is immersed in a bath of zinc; the edges and coils are thus secured and consolidated, and the tube is rendered incorrodible. It will thus be seen the necessity for subjecting any of the parts of a tube thus produced to a welding heat is avoided, thereby preventing the occurrence of what are known as "*wasters,*" and common to the existing process of manufacturing wrought-iron tubes, and producing the tube or other hollow article much stronger, lighter, and of a more uniform good quality than tubes of the ordinary make. For some purposes, the surfaces of the sheets of metal are prepared so as to produce a ready and perfect union or combination of the layers or coils.

For tubes to be subjected to great internal pressure, the external surface is hooped or banded.

Tubes for gas, water, steam, and various other purposes, hollow girders, boiler, and other flues, the barrels of cylindrical and other boilers, and such little articles, can be produced with great facility—very strong, light, and true; avoiding welding, frequent reheatings or punching and riveting of the parts.

If tubes or other articles are required, of copper, or brass, or any similar composite metal, one surface or both surfaces of the sheet or sheets of which the tube or other article is to be formed, may be tinned or otherwise thinly coated with a suitable soldering material; or the edges, and that part of the sheet corresponding with, or coming opposite thereto, after the tube has been lapped or wound up, may be soldered together, or secured in any similar or suitable manner. When the purpose for which the tubes may be required renders it necessary that the ends thereof should be screwed, a thin ferrule is taken, of a proper size, screwed externally, or what is known as a nipple or thimble-piece; and, having made it sufficiently hot, one is shrunk on to each end of the tube, and immersed in a suitable metallic bath, and thereby securely attached to the tube; or a short piece of plain tube is taken, shrunk on, galvanised, and afterwards screwed in the ordinary way; or the ends of the tubes may be screwed, by the application of "dead pressure," with screwed blocks or dies raising the threads, instead of cutting or removing portions of the metal, as in screwing with stocks or dies.

In forming tubes or other articles of a greater length than one sheet of metal, the joint or joints are so arranged that there shall be no break or weak place in the article manufactured.

The coiling of the sheets is performed by wrapping them around a spindle, composed of three parts. This mandril may be fixed between the centres of a beautiful lathe, or it may be fixed between the heads of a machine constructed for the purpose; the edge of the sheet being true, is inserted in a groove, or otherwise secured, and a rotary motion being communicated to the spindle, the sheet is taken up and lapped or coiled round it, proper precautions being taken to ensure the perfectly close contact of one coil or lap over the other; and when a sufficient number of turns or coils have been wound upon the mandril, the whole must be secured, either by banding or coiling with binding-wire, or with temporary clamps. The ends of the tube are then cut square, making the tube of a proper length; and the core or mandril is next withdrawn, and the tube finished by securing the inner and outer edges, or by massing, consolidating, or soldering the parts together by immersion in a bath of molten metal.

The inventors claim as their invention—

1. The application of a thin sheet of metal coiled, wound, or lapped around a suitable core, mandril, or mould, to produce a tube, or other hollow article, in the manner described.

2. The forming of one layer, or series, over another, continuously and in close contact, without welding the edges of the plate or sheet together, for the purpose of producing a light and strong tube or other article, whatever may be the configuration or section, if hollow; and whether formed upon a core or mandril, or otherwise.

3. The galvanising or immersing in molten metal, for the purpose of soldering together, massing, or consolidating articles so made.

No. 1590.—John Sudbury, of Halstead, Essex, and Samuel Wright, of Clare, Suffolk, gas engineer, "*Improvements in taps and valves.*" Patent dated Jan. 20, 1855.

These improvements refer to such taps and valves as open by moving or rising parallel from the seat to which they are fitted. In valves so fitted, the opening and closing of the passage is very sudden, by reason of a slight lift of the valve disclosing a large area of passage. This sudden stoppage and opening of the passage have been found particularly objectionable in taps or valves which regulate the supply of water, or other fluid, by means of a ball, valve, or tap, as preventing the perfect action of the tap, and being attended with considerable wear and tear. This improvement consists in so arranging the passage of the valve that the opening and closing shall be gradual, without making any alteration in the movement of the valve. For this purpose, a solid piece of metal is extended from the under side of the valve, which piece fills up the passage in the seat, but allows the valve to rise freely from its seat. To provide a passage for the fluid, angular notches in the piece of metal, in the direction of the motion of the valve, are cut. The depth of the angular notches, as they approach the valve, decrease and disappear altogether; while in the opposite direction they are cut as deeply as possible, to ensure the required passage. Thus, when the valve first rises, although considerable opening exists between the valve and its seat, the thoroughfare is restricted according to the passage afforded by the grooves before mentioned. The further motion of the valve from its seat increases the area of passage through the grooves until the greatest passage is obtained. The opening and closing of the passage will be more or less gradual according to the form of the grooves; other forms of passages may be substituted for the grooves in the filling-place before mentioned, whereby to restrict and regulate thoroughfare through the valve. The improvement in working valves for regulating the passage of fluids refer more particularly to regulating the passage or supply of gas, which is effected by means of a small gas receiver or holder, which is floated in water, or other suitable fluid; it is subject internally to the pressure of the gas; and, according as the gas is at a greater or less pressure, the gas-receiver rises and falls, and becomes more or less immersed; the receiver of the regulator is suitably connected with the valve through which the supply of gas has to pass, so that when the pressure increases the passage is diminished; and when the pressure is decreased, an opposite effect is produced, and thereby regulates the supply of gas. The barrel of the tap is furnished with a seat or face, against which the valve or plug is forced, which stops the passage of the fluid. Ball-taps, heretofore constructed on this plan, have been subject to considerable objection on account of the sudden stoppage of the passage which takes place when the valve nears its seat, by reason of a small amount of motion in the valve disclosing a large area of passage. The ball-lever, being subject to the motion of the fluid in the cistern, continues to open and shut the valve when it ought to close; and the large area of passage disclosed permits a strong rush of the fluid, and thereby continues the agitation in the cistern, preventing the entire closing of the passage for some time, and subjecting the taps to a considerable amount of wear and tear. To obviate this, the inventors apply a solid cylinder of metal to the face of the valve, which is large enough to nearly fill the passage of the seat. In this cylinder is cut a number of V grooves, so as to afford as much passage as possible at the end of the cylinder or plug farthest from the valve face. The grooves are cut less deed as they near the valve face, and disappear altogether at some little distance from that point. The valve is furnished with an india-rubber or leather facing, and is mounted on a stem moving in suitable guides, and connected to the ball-lever by a link; while the lever moves freely on its fixed fulcrum, and actuates the valve by moving up and down with the alteration of level of fluid in the cistern or other receptacle in the ordinary manner. Instead of V grooves cut in a solid cylinder, the cylinder may be tubular, and have holes bored through at different distances from the face of the valve.

The inventors' claim is—

1. For constructing taps and valves, with the arrangement of plug for reducing the area of the passage as the valve approaches its seat, as before described.

2. For the arrangement of apparatus for the purpose of regulating the passage of gas and other fluids.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

2715.—George Anderson, of the Gas Works, Rotherhithe, in the co. of Surrey, gas engineer, for "*Improvements in purifying sewers and buildings, or other places, of noxious vapours.*" Dec. 23, 1854.

2728.—Thomes Boyle, of 45, Skinner-street, Snow-hill, city of London, for "*Improvements in reflectors for artificial light.*" Dec. 27, 1854.

13.—Felix Gabriel Célestin Dehaynin, of Paris, and of 32, Essex-street, Strand, for "*Improvements in the purification of hydrogen gas.*" Jan. 3, 1855.

30.—Louis Dominique Girard, civil engineer, of Paris, for "*Certain tain improvements in applying steam, fluids, and gases for the purpose of obtaining motive power, parts of which are applicable for compressing and rarefying air and gases, and for raising liquids.*" Jan. 5, 1855.

78.—Smith William Davids, of Carnarvon, North Wales, slate agent, for "*Certain improvements in elongating chandeliers and gaseliers.*" Jan. 11, 1855.

84.—Ezra Miles, of Stoke-Hammond, Bucks, civil engineer, for "*An improved coupling-joint, or connection, for tubing and other purposes.*" Jan. 12, 1855.

110.—Henry Adkins, of Edgbaston, near Birmingham, in the co. of Warwick, manufacturer, for "*An improvement, or improvements, in bleaching or decolourising oily and fatty bodies.*" Jan. 16, 1855.

170.—William Kilgour, of Liverpool, in the co. of Lancaster, merchant, for "*An improved manufacture of naphtha, paraffine, and paraffine oil.*" Jan. 22, 1855.

177.—George Brooks Petit and Henry Fly Smith, both of New Oxford-street, in the co. of Middlesex, gas engineers, for "*Improvements in stoves and other apparatus for generating heat from gas, and in the employment and removal of the vapours produced by its combustion.*" Jan. 23, 1855.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

1.—Epamnonda Frascara, of Alessandria, in Piedmont, now of 12, Alfred-place, Bedford-square, for "*A voltaic pile, and of the application of its electric fluid either to the decomposition of water, or to enable the gases to replace the steam-power actually in use.*" Jan. 1, 1855.

2057.—George Danré, of Marseilles, France, and of 16, Castle-street, Holborn, for "*Certain improvements in gas-burners.*" Sept. 23, 1854.

2702.—John Hunt, of Birmingham, in the co. of Warwick, brass-founder, for "*An improvement or improvements in illumination.*" Dec. 22, 1854.

30.—Louis Dominique Girard, civil engineer, of Paris, for "*Certain improvements in applying steam, fluids, and gases, for the purpose of obtaining motive power, parts of which are applicable for compressing and rarefying air and gases, and for raising liquids.*" Jan. 5, 1855.

Legal Intelligence.

JUDICIAL COMMITTE OF PRIVY COUNCIL.

Thursday, Jan. 11, 1855.

Before Sir John Dodson, Mr. Pemberton Leigh, and Sir E. Ryan.

LOWE'S PATENT FOR IMPROVED METHODS OF SUPPLYING GAS.

This was an application on behalf of Mr George Lowe for the prolongation of a patent granted to him in March, 1841, for improved methods of supplying gas under certain circumstances, and of improving its purity and illuminating power.

Mr. Webster, on behalf of the petitioner, stated, that the gas supplied by public companies had long been known to contain many impurities, which prevented it from being used for domestic purposes to the same extent in London and other parts of this country as it was in Edinburgh, where it was obtained from a different sort of coal. At certain times, and in certain localites, there was a deficiency of supply. The object of the patent was to obviate all these objections. During the day, the pressure of the gas supplied by the companies was frequently insufficient to force it through the meter; but Mr. Lowe added to the meter a motive power which remedied the defect. He had also succeeded in inventing an apparatus by means of which the gas was purified of sulphuretted hydrogen, carbonic acid, and ammonia, with its compounds; the gas being at the same time saturated with naphtha, by which its illuminating power was greatly increased. The apparatus was so simple, that it could be placed with perfect ease and safety on the same shelf as the common meter. The result was, that gas could be burnt in private houses with great comfort and at a large saving of expense to the consumer. Hitherto the receipts from the working of the patent had not been equal to the outlay incurred in procuring it; but, public attention being now aroused to the importance of pure gas, there was every probability of its becoming remunerative.

Mr. Lowe having described his apparatus, and illustrated its efficiency by experiment, Sir *James Clarke*, Professor *Brand*, Mr. *Smee*, of the Bank of England, Mr. *Warington*, the analytical chemist of Apothecaries'-hall and inspector of gas on the south side of the Thames, and Professor *Hoffman* were examined, and spoke in unqualified terms of the utility and perfect operation of the invention. Mr. Smee exhibited the cover of a book which had been destroyed in a public library by the impure quality of the gas consumed. He stated that in Russian leather the action took place at the angle where the back of the cover was attached to the sides, and in calf-binding the leather peeled off in flakes. The sulphurous acid in the leather was perceptible to the taste.

Mr. Welsby, on behalf of the Attorney-General, offered no opposition.

Sir E. Ryan said, their lordships were of opinion that there was considerable merit in the invention, and they would advise her Majesty to extend the patent for five years.

COURT OF COMMON PLEAS,

Westminster, Jan. 18, 1855.

(*Sittings in Banco, Hiliary Term.*)

THE NORTHAMPTON GASLIGHT COMPANY, *v.* W. PARNELL AND ANOTHER.

The question raised in this case arose on demurrer. The action was brought by the plaintiffs against the defendants, as sureties of one John Parnell. John Parnell, it appeared, had covenanted, in a deed with the plaintiffs, to commence and finish a gasholder tank and other works, to the satisfaction of one John Eunson, within three months from the date of the deed; and that, if it should at any time appear that he did not prosecute the work with due diligence, the plaintiffs should be at liberty to put an end to the contract, and engage workmen to complete it. The works were to be completed on or before the 30th of June, 1853, under a penalty of £50, and £1 for every day afterwards that they remained unfinished. The defendants, as sureties for J. Parnell, covenanted that he should perform and keep all the covenants entered into by him with the plaintiffs, and in default, that they would pay the plaintiffs such a sum of money for liquidated damages as the said John Eunson should deem reasonable, such sum not to exceed £300. The declaration then proceeded to allege that the works were not finished at the stipulated time, nor until 300 days afterwards, whereby the defendants had incurred damages to a large amount; and that John Eunson had adjudged the sum reasonably due to the plaintiffs at £300. The defendants pleaded, that the deed contained a covenant by the plaintiffs as to the mode of payment to be made by them to J. Parnell for the work done, and averred that the plaintiffs had not executed the deed until three months after the 30th of June, 1853, and had never paid J. Parnell any part of the sums agreed by them to be paid to him; and that, before the adjudication of John Eunson, both J. Parnell and the defendants had revoked any submission to arbitration contained in the deed; and that Emerson had adjudicated without their being heard. To these pleas the plaintiffs demurred.

For the plaintiffs, the case was argued by Mr. Field; and for the defendants by Mr. Keating, Q.C. (with whom was Mr. W. R. Cole.)

It was contended for the plaintiffs, that the non-execution of the deed by the plaintiffs till the time mentioned in the plea, was no justification of the breach of covenant alleged; and, as to the second plea, that the adjudication of Eunson was not in the nature of an award, nor subject to revocation; and it was not alleged that the revocation had been made under seal. For the defendants, it was contended that the plaintiffs' execution of the deed was a condition precedent; and that as they had not executed it until after the 30th of June, and had not made any of the stipulated payments, they had no ground of action. As to the second plea, it was contended that the defendants were only liable for the non-observance of such as had been annulled; and, as the adjudication was made in respect of all the covenants, it was bad in law.

The court were of opinion, that judgment must be for the plaintiffs on all the points argued. As to the first point, it was evidently the intention of the parties that the work should be commenced at once; and that the words in the deed, "on the execution thereof," meant on J. Parnell and the defendants executing it; otherwise the deed might have been delivered as an *escrow*, and probably would have been so. As to the second point, the court were of opinion that Eunson acted merely as an appraiser, and not judicially; and the case was not to be distinguished from the ordinary case of an agreement to pay for work done upon the certificate of an engineer or surveyor.

Judgment for the plaintiffs.

LIVERPOOL COURT OF PASSAGE.

Feb. 6, 1855.

(Before Edward James, Esq., Assessor.)

The Liverpool New Gas Company (that was to have been.)

JEFFERY AND ANOTHER, *v.* FLINTOFF.

This was an action to recover £20. 19*s.* 3*d.*, for goods supplied by Messrs Jeffery, Morrish, and Co., the proprietors of Compton House, to the defendant, Mr. George Flintoff, one of the "Liverpool New Gas Company." Mr. Blair, instructed by Mr. Payne, appeared for the plaintiffs; and Mr. Tindal Atkinson, instructed by Mr. Campbell, for the defendant.

It will be remembered that about eight or nine months ago, a great deal was said about the high price charged for gas by the Liverpool United Gaslight Company. Public meetings were held, and an opposition company talked of. At length a new gas company was advertised, provisionally registered with the names of several gentlemen as directors, and with Mr. Flintoff's name as secretary to the company. Extensive premises were taken in Basnet-street, for offices for the new company, and a "board-room" was very handsomely furnished; a rich carpet having been obtained from the plaintiffs, costly chairs from Messrs. Urquhart and Son, a mahogany table, desks, and other goods from other tradesmen. Some difficulties occuring, several of directors retired, others came in to supply their place, but eventually the company broke up, and Mr. Flintoff was left "in possession" of the new offices and all they contained.

The plaintiffs brought the present action to recover the value of the carpets which they supplied. The following is an outline of the case, which occupied a length of time:—

In the latter part of July, before the company was registered, the defendant, Mr. Flintoff, accompanied by Mr. Smethurst, a gentleman who was assisting him to get up the company, went to Compton-house, and saw Mr. William Jeffery. They showed him the list of provisional directors which had been drawn up, and he remarked that they were not men of sufficient weight to enable the company to be started successfully. Mr. Flintoff said he wanted a carpet for the company's office, and Mr. Wm. Jeffery accompanied him to choose one, remarking to the gentleman who has charge of that department in Compton House, "Mr. Stratton, these gentlemen want a carpet." Two carpets and other smaller articles were supplied on the 1st of August, and Mr. Flintoff subsequently saw Mr. James R. Jeffery, submitted the list of directors, and wished him to become one. Mr. Jeffery declined, and made a similar remark to that of his brother, that the names were not of sufficient weight, adding that he had been out of town, or he would have assisted defendant to obtain a better list of names. Mr. Durandu and Mr. Cope, two gentlemen connected with the "board of direction," were examined as witnesses for the plaintiff, and made some amusing disclosures, which materially affected the result of the case. Mr. Cope said that on remonstrating with the defendant about the costly style in which the offices were furnished, he asked him if he had ever read Dickens's account of the board-room in the "Bubble Company,"—(laughter)—and that defendant replied that he had, but the furniture was nothing to him (Mr. Cope), as he had paid for part of it himself, and was liable for

the rest. The collector from Compton-house swore that he called at the office of the new company twice, and saw Mr. Flintoff, the defendant. On the first occasion the defendant said he would "see Mr. Jeffery about the account." The next time the collector called he asked for money, and then the defendant said if he would come in about a fortnight he would give him a cheque for the amount. Continual discussions arose in the provisional committee about liability. It consisted of twenty-one members, and when a portion of them retired, Mr. Flintoff was desired to present an account of the debts of the company to that time. He did so in October, and the document, which was produced in court, contained no items for money due to the plaintiffs for carpets, or to Messrs. Urquhart for chairs, &c., but the last item was put down by Mr. Flintoff as £10 due to him "for the use of furniture." Plaintiff's counsel strongly urged that in this document defendant acknowleged that the furniture had been supplied to him alone, as he assumed himself to be the owner of it. The defence was, that it had been supplied to the company, and that, therefore, the provisional directors, if any, and not the secretary, were liable.

Mr. *Smethurst* was called as a witness for the defence to prove that the plaintiffs were aware that they were supplying the goods to the company, and not to Mr. Flintoff.

Cross-examined by Mr. BLAIR: I came to the company with Mr. Flintoff. There was no particular arrangement made for salary. It was not my and Mr. Flintoff's speculation. Deposits in shares were received by Mr. Flintoff.

Re-examined by Mr. ATKINSON: They were regularly entered in a book, which is still open for inspection.

Letters applying from payment of the account from plaintiffs to Mr. James Hobbs, Mr. Thomas Godfrey, and others, were put in and read.

Mr. *George Flintoff* called, and examined by Mr. ATKINSON: Had been secretary of the New Gas Company. The company was registered on the 1st of August last year, in the names of several gentlemen, which were read. On an early day in August ordered a carpet for the company's room, at Compton-house. The carpet was supplied, and the invoice charged to the provisional committee. Mr. William Jeffery went with witness to Mr. Stratton, and said, "these gentlemen want a carpet." The provisional committee met once or twice a-week. Met four days after the carpet was laid down. No complaint was made for eight or nine weeks that the carpet was too expensive. When complaint was made of the expense, told the committee that if he had done wrong they should have sent the carpet back. At the very first meeting, on the 12th of August, the question of liability arose. Mr. Squarrey, the solicitor, informed the committee that everything ordered for the purpose of the committee would have to be paid for by them. No subscription had ever been made by the provisional committee for carrying on the company. After that witness always ordered what the company required, subject to their approval. On three distinct occasions received orders to make out a list of the liabilities. On the 12th of October, the liabilities were found to be near £70, and the dozen gentlemen who retired from the directorship offered £10 as their share, but it was never paid. Witness never said he was responsible for the carpet. Was never applied to for payment until the attorney's letter came.

Cross-examined by Mr. BLAIR: Had never said he would send a cheque. Had said he would see Mr. Jeffery about it. Came to Liverpool about the 1st of July to get up the company. Had not aided in getting up any other company since. Had said he would work without any salary until the company was formed. Had received about £30 in deposits, and paid away about £100. Let the upper part of the premises for a picture gallery to diminish the rent. The carpet was not put down, because they had only a ground floor, and it would have been injured. The carpet was now rolled up at witness's house. The table he had paid for himself. The £10 in the account had nothing to do with the table. The account was made out at the request of the directors.

By the COURT: The chairs remain in the board-room.

By the JURY: There were no minutes of the provisional committee previous to the 12th of August?

Mr. *James Hobbs*, called: Was one of the provisional directors. There were frequent conversations about the furniture. The carpet was a matter of disputed liability.

After Mr. Atkinson had addressed the jury on behalf of the defence, Mr. Blair had replied, and the learned Assessor summed up,

The jury at once gave a verdict for the plaintiffs.

Miscellaneous News.

CITY OF LONDON COMMISSION OF SEWERS.

TUESDAY, FEB. 6, 1855.

THE CITY OF LONDON GASWORKS.

Mr. Ross, a member of the Court, introduced a deputation from Bridge-street and its neighbourhood, who complained that, notwithstanding the nuisance already in existence arising from the City of London Gasworks, that company were carrying a bill through Parliament for the purpose of obtaining power to take ten additional acres of land in the vicinity of the Temple, which step there was every reason to believe would greatly aggravate the evil complained of.

Mr. LE BLANC, one of the deputation, said that the ostensible object of the bill was to raise an additional sum of money, but was in reality to increase the extent of the company's premises. The noxious effluvia escaping from the works had already affected the health of the surrounding inhabitants, who would have their comforts interfered with to a degree commensurate with the extension of the works. The company had already spent £140,000 on their works, and they now proposed to increase their capital to the extent of £400,000. The deputation therefore called upon the Court to stop a proceeding which they considered prejudicial to the health and comfort of the inhabitants.

The CHAIRMAN said that the matter had been before a committee, who were ready to make their report to the Court.

Mr. LE BLANC: The bill is to be read a second time in the House of Commons to-night, and we, therefore, thought it necessary to come before the Court at once.

The CHAIRMAN: In what way do you consider that the enlargement of the premises will lead to a nuisance?

Mr. LE BLANC: The larger the premises the greater will be the nuisance. The air is, at present, very much affected by the coke that is left to cool.

Mr. ROSS: Is it not a fact that during the process of the manufacture of gas there is a residuum formed which is sent into the Thames?

Mr. LE BLANC: Yes; that is so.

Mr. H. L. TAYLOR: What do apply to this commission for?

Mr. LE BLANC: We want the assistance of the commission to prevent the increase of what we consider a nuisance.

Mr. H. L. TAYLOR: What assistance can we render you?

Mr. LE BLANC: We leave that to you. We do not know what your powers are.

Mr. SAYWARD, another of the deputation, said that the inhabitants in the vicinity of the gas-works suffered so much inconvenience from the stench arising therefrom that they were of opinion that the works should be altogether removed from the city, and they therefore called upon the commission, as conservators of the health of the citizens, to oppose a bill, the passing of which was likely to be attended with injury to health and comfort. The company were indicted for a nuisance three years since, but still nothing had been done with a view to the effectual removal of the evil complained of.

Mr. H. L. TAYLOR: As the company are to apply to Parliament either to-night or almost immediately, will not your better course be to petition the Legislature for leave to oppose the bill?

Mr. SAYWARD: We have a requisition, signed by 200 persons, calling upon the alderman of the ward to convene a meeting to petition Parliament to throw out the bill, but the present step on the part of the company has been of such a precipitate nature that we have not had time to move in the matter.

Mr. GRAY, the chairman of the company, said: I was in the House last night when Sir B. Hall offered an objection to the bill. According to the ordinary rules of the House, the bill would be brought forward to-night, but I stated to Sir B. Hall that we had no desire to precipitate its passing, and wished every person to have an opportunity of expressing his opinion upon it: and, at my suggestion, the bill will be brought forward on Friday week. When we were indicted, we knew it was of no use engaging ourselves in a long course of litigation, and we accordingly confessed judgment upon the express understanding that we should have sufficient time allowed us to make the necessary alterations in our premises, with a view to the abatement of the alleged nuisance. We have, in carrying out this object, needlessly expended a great deal of money; we have already spent more than £15,000, and before the whole of the alterations are completed we shall probably have expended £20,000. We are now adopting a different mode of purification.

Mr. DAW, the chief clerk, then read the following report of the Committee on Improvements, to whom it was referred to consider the provisions of certain bills before Parliament:—"In respect of the City of London Gas Company's bill, which provides for the perpetual continuance of the company's powers, which, under their present act, expire in 1863, we are of opinion that, in respect of a trade such as that of the City of London Gas Company, the commissioners should not give any opinion that is likely to encourage the continuance in perpetuity of such company's works within this city. Dated the 2nd of February, 1855."

The report was adopted, and the Court adjourned.

CITY OF LONDON GAS COMPANY.

On Wednesday, Jan. 17, the usual Half-yearly Meeting of this Company was held at their offices, Dorset-street, for the purpose of receiving the report of the directors, and statement of accounts; declaring a dividend; authorising the directors to apply to Parliament for powers to incorporate the company in perpetuity, and to increase the capital of the company to £400,000; and for the election of officers to supply the places of those retiring by rotation.

R. A. GRAY, Esq., the chairman of the company, presided.

Mr. MILLAR, the secretary, read the minutes of the last half-yearly meeting, which were confirmed; after which the following report of the directors was read:—

"Gentlemen,—At the last half-yearly meeting, your committee expected that the dry lime purifiers, rendered necessary by the City indictment, as also the arrangements for the general supply of cannel-coal gas, would have been completed and in use by this time; they have now to report that the works are in a very advanced state of forwardness; but circumstances have arisen to render it prudent to postpone their actual operation for a short time longer.

"With reference to the dispute with the coal contractor, the committee are happy to report that a satisfactory compromise has been effected; and thus the risk and delay of a law-suit prevented.

"Your committee, having directed their attention to the act of Parliament under which the company is incorporated, and which the proprietors will remember expires in 1863, have considered it advisable to apply to Parliament to perpetually incorporate the company, and to give power to increase the capital to £400,000; to vary the qualification of directors, and to remodel the existing shares; and, believing the ensuing session of Parliament will be favourable for the purpose, they have caused a petition to be deposited in the House of Commons, for leave to bring in a bill for these purposes.

"The inconvenience arising from the limited capital of the company has been again felt during the past half-year; and the loan-fund not having realised the amount anticipated, your committee have been com-

pelled to apply to the treasurer for a temporary loan, which he has very kindly responded to.

"Your committee are happy to report that they have been able to advance the price of gas to 4s. 6d. per thousand feet from Michaelmas last in the districts without the city, being the price charged by surrounding companies.

"The half-year's accounts, which will now be submitted, your committee flatter themselves will be regarded as satisfactory, considering the continued advance in the price of materials. The net profit for the half-year, as per No. 1 statement, is £5469. 7s. 9d.; and the balance at your disposal, as per statement No. 3, to which the signature of your auditors is attached, is £5656. 9s. 7d., subject to one quarter's income-tax; out of which sum your committee unanimously recommend you to declare a dividend for the half-year at the rate of £3 per cent. per annum, payment thereof as usual.

"The state of the rental is shown in the statement No. 4. The amount for the half-year to Christmas is £29,362. 8s. 4d., being an increase on the corresponding half-year of 1853 of £1080. 16s. 6d.

"In accordance with the requirement of the act of Parliament, your committee now resign their seats; and, in doing so, feel gratified that there are palpable indications that your concern is gradually recovering from its depression. They offer themselves again for re-election, and, should they be favoured with your confidence, their best energies will continue to be devoted to promote and increase the prosperity of the company.

"R. A. Gray, Chairman."

The statement of accounts and balance-sheet were then submitted to the shareholders, from which it appeared that the net profit of the company for the half-year amounted to £5469. 7s. 9d.; and the balance at their disposal, subject to one quarter's income-tax, £5656. 9s. 7d.

Mr. Sangster, deputy-chairman, then rose and said: Mr. Chairman and gentlemen, before the usual motion for the adoption of the report is put to the meeting, I beg leave to take this opportunity of announcing to the meeting that, owing to impaired health and the infirmities of age, I feel it to be my duty to tender my resignation of the office which, for so many years, I have had the honour of holding amongst you. For upwards of thirty-five years I have been a director of this company; and I am sure that, after so protracted a period of active, earnest, and I trust, not inefficient services, you will not think that my retirement is precipitate, or attributable to the want of interest in your success. (Loud cheers.) I assure you, gentlemen, that with my retirement from office are associated the deepest feelings of regret; for during the whole period of our connection I have invariably experienced a kindness and friendship on your part—(hear, hear)—which it is delightful to contemplate, and the recollection of which materially mitigates the painful sensations associated with a severance induced by absolute necessity. (Hear, hear.) With respect to my resignation, I have stated my intention to my colleagues; but the chairman has requested me to remain in office until, at least, we have procured our act of Parliament, in the attainment of which he is kind enough to suppose that my services may be of some little use. (Hear, hear.) Under the impression that such will soon be the case, I have no objection to occupy my present position as your deputy-chairman for some time longer; but when your act of Parliament is obtained—which, I have no doubt, will be accomplished without difficulty—I shall then request you to allow me to retire; and, in the meantime, I hope the gentlemen around me will look out for a qualified person as my successor. (Cheers.)

The Chairman then said:—Gentlemen, you have heard the report for the last half-year, and the statement of accounts for the same period verifying that report. It is now my duty to propose to you that it be received and adopted. I will now say a few words generally as to my view of the condition of the company. You have heard from my respected friend, Mr. Sangster, that he is about to retire from the direction, and from the office of deputy-chairman. It cannot be a matter of much surprise to us, considering his long association with the company; but I have heard with regret the confirmation of the announcement which he made some time since to the committee, but it is somewhat mitigated by the circumstance that, as long as he can be of any service to us, he is willing to remain in his present post, for which I am sure we all must feel very much indebted to him. (Hear.) I think it is very desirable that he should remain amongst us, for he is practically acquainted with the working of the concern; and therefore I hope he will receive the unqualified approbation of the meeting in the course he proposes. (Hear.) As to the condition of the company, the anticipation which I have long entertained that we have seen our worst, every day more fully confirms that view. It is well known that we have had great difficulties to encounter, and I know very well the disappointment you have experienced in the gradual diminution of our dividend. But this is not a solitary instance of companies being brought into a low condition, in proof of which I may refer, not only to railways, but to many other companies which, from a reduction in the dividend, have experienced a great depreciation in the value of the property they have invested. We were always of opinion that 4s. per thousand as the price of gas would never afford a remuneration for the capital. That opinion is verified every day; and I cannot give a stronger instance of it than has recently taken place on the south side of the Thames, where a company was established proposing to charge 4s. per thousand, and to be in a position to pay a dividend of ten per cent. Very soon, however, that delusion was removed, and by combining together they have effected on the south side of the Thames that which I should like to see prevail all through the metropolis. The arrangement between the Great Central, the Chartered, and ourselves, was to charge 4s. per thousand within the limits of the city; but the Imperial and several others are charging 4s. 6d. out of our district; and I cannot say that the Great Central will not continue to supply gas at 4s. You have seen the reports which they have made from time to time; and if they pay a better dividend than ourselves, it is owing to their having made a a favourable contract with Mr. Croll, who has been fortunate in getting coals supplied at a lower price than other companies are in the habit of doing. I feel convinced that this company is progressing slowly to restoration to that state of prosperity which marked it for a long time. Every available means is adopted by economy in the works to bring us to a more prosperous state than we are at present: but to effect that we must have active co-operation of the proprietors. We have hitherto had your confidence, and I do not think we have done anything to forfeit your good opinion; for directors are not always to be judged according to the dividend they are able to give. We have always given you as good a dividend as we were able. We have seen days of adversity, but the cloud is dispersing, and at no distant day our dividend will improve. You have been informed in the report that our rental is on the increase: some time ago we lost the public lights, which effected a diminution in our receipts to the extent of £3000 or £4000 a year, but that has been compensated by the increase of our private rental. With regard to the other matters alluded to in the report, I would state that our act of Parliament expires in the year 1863. We think the present a very fitting opportunity to go to Parliament to make our act in perpetuity, inasmuch as several other gas companies are about to go to Parliament for various objects. We do not apprehend that we shall meet with any opposition in the course we propose to take; but I can assure you that we shall not engage in a parliamentary contest which will expose us to any expense. From all I see I do not anticipate any difficulty in the matter. The heads of the bill will be read to you by your solicitor, Mr. Tyrrell; and, if your views coincide with ours, we shall prosecute that bill in Parliament in the present session. We think it essential to have fresh powers: amongst other things, to increase our capital; and, in the next place, we must have parliamentary sanction to that which we have done with some irregularity—namely, to capitalise profits, which we have not the power to do under our present act. You are aware that the subscribed capital of the undertaking is £200,000; but we have laid out £300,000, £100,000 being profits which might have been divided; but if that had been done, we must have gone to Parliament at a much earlier period for an increase of capital. We shall then have a larger disposable property to lay out for the benefit of the proprietors.

A Shareholder wished to draw the attention of the meeting to a paragraph in the report, which stated that the dispute between the company and the coal-contractor had been satisfactorily compromised, and further litigation prevented. He had been given to understand that the loss to the company, owing to the coal-owner's breach of contract, amounted to £2000. Was that the fact?

The Chairman: The company certainly sustained a loss by the transaction, but not to the extent supposed. Our loss at the most could not be more than £1000; and, however good a case we might have for an action, it should be recollected that, as the trial of it would have to take place in Northumberland, the expense of taking witnesses to such a distance, and the hazards and uncertainties of law, disposed us to come to an amicable arrangement. On the whole, we have not been seriously damaged, inasmuch as we have entered into a new and advantageous contract for 5000 or 6000 tons of coal, and at a price so reasonable as almost to indemnify the company for whatever they may have lost on the original transaction. (Hear.)

The Chairman then put the motion for the adoption of the report and statement of accounts, and it was unanimously agreed to.

On the motion of Mr. Tyrrell, it was unanimously resolved that a dividend at the rate of £3 per cent., free of income-tax, be declared, payable on and after the first Tuesday in March.

The Solicitor of the company then said, he was desirous of informing the meeting of the provisions of the bill which it was their intention to bring before Parliament. One of the objects of the bill was to incorporate the company in perpetuity. The present act would expire in 1863, and it was desirable in lieu of that to have a perpetual act. The act of this company was one of the earliest that was passed; and at that time, he said, there was an objection on the part of the House of Lords to make these acts perpetual; but, as all subsequent acts incorporating gas companies had been perpetual, there could be no ojection to make this company so likewise. The next object of the bill was to increase the capital of the company to £400,000. Under the present act the capital was £200,000; without the sanction of that act they had increased the capital £100,000; and it was considered desirable to obtain further powers in respect of capital, in case the company required additional funds. It was then proposed that the shares which were originally £100, but upon the increase of capital by £100,000 raised to £150 each, should be reduced. It was considered that the amount of the shares was too large for general circulation, and it was now proposed to divide the existing shares into 12,000 shares of £25; that is, to divide the present share of £150 into six shares of £25 each. It was then proposed that the additional capital of £100,000 should, when required, be issued in shares of £25 each, to be offered in the first instance to the present proprietors; and also that the qualification for a director, which was now a holding of fifteen shares of £150 each, should be altered to the holding of forty shares of £25 each, or £1000 in lieu of the present qualification of £2250; the qualification for auditors to be reduced in the like proportion. Those were the important parts of the bill, and he need not do more than ask their sanction to the prosecution of the bill for carrying out the important objects he had mentioned. He then moved that the committee be authorised to prosecute the bill in the present session of Parliament. (Hear, hear.)

A Proprietor observed, that there were some particulars in the accounts which appeared to him to require explanation, and he hoped he would not be considered obtrusive if he called the attention of the shareholders to them. It appeared from the statement laid before meeting that they had expended a sum of £170,000 in matters which appeared to him to be not strictly appertaining to their business as manufacturers and distributors of gas. A large sum had been expended in the new street, and a further sum in the new docks, which was not employed in the operations of the company. He wished to ask whether the Legislature would sanction the application of capital to other purposes than the manufacture of gas; and under

those circumstances, he would ask whether any necessity existed for increasing the capital to £400,000. With regard to the reduction of the nominal value of the shares, he thought £50 each would be a better amount than £25. He questioned whether the Legislature would sanction their holding capital for other purposes than the manufacture of gas.

The SECRETARY said, the two items referred to were equally plant, only under a different designation. The distinction in the accounts was commenced when the company took the Dorset Wharf premises.

Mr. TYRRELL said, if they were to start *de novo*, Parliament would of course allow them to purchase the land necessary for their works. Under whatever heads it was put, they were in possession of no other property than works or land required for works, which Parliament would not only sanction, but, looking at the increased consumption of gas, would authorise the purchase of a larger quantity of land if it were necessary for those purposes. Therefore, this must not be regarded as independent of works; but the committee, wisely foreseeing the necessity, had made a judicious purchase, instead of having to pay through the nose for the property; and he believed the works had now extended nearly over the whole of that purchase.

A PROPRIETOR thought the reduction of the shares to £50 would be a better amount than £25. The Imperial shares were £50.

The CHAIRMAN: The advantage is, that it will induce many persons to join the concern who would be deterred by £150 shares. The Commercial are £25, and the Great Central as low even as £10. The object is to get a more extended proprietary.

Another PROPRIETOR suggested that there was no immediate requirement of fresh capital.

The CHAIRMAN: I need not assure you that the money will not be laid out unless it can be done beneficially for your interests. Each shareholder will have the option of taking the additional shares; it will not be compulsory to do so. The disadvantage we have laboured under is having so few persons interested in our prosperity. The shares have been in few hands, and very few persons take an interest in our affairs; whereas, if we had a more extended proprietary, which is the object in reducing the amount of the shares, you will have six persons interested in the concern where only one is interested at the present time, and you may anticipate the advantage to be derived from such a state of things.

The PROPRIETOR: Then the intention is to make calls as necessity requires?

The CHAIRMAN: It may happen that we may find it more profitable to borrow money upon loan than to issue the new shares at all.

Mr. PERRY said he thought the new shares would not be readily taken up, whilst they were paying only 3 per cent. He would ask whether the £50 which they had added to the original sum was not jeopardised?

Mr. TYRRELL: Not in the least.

Mr. PERRY: It may be that you have increased your capital illegally?

Mr. TYRRELL: You are dealing with a fact?

Mr. PERRY: But I am dealing also with a fiction, for your shares were originally £100 each, and your application is for an increase of capital of £200,000.

Mr. TYRRELL: It is an answer to say, that you have got the £100,000 in works, instead of in money. That would be no fraud upon Parliament. It will be better to state that, and to ask for—if I may use the term—a bill of indemnity for having done so.

The CHAIRMAN: The £100,000 extra we must look upon as a debt due from the company to every individual member of it. We go to Parliament and say, our expenditure has been so much beyond what our act permitted, and we ask for legislative sanction to it.

The resolution was then unanimously adopted.

Mr. GRAY then vacated the chair, and Sir Chapman Marshall having been called to the same,

Mr. TYRRELL moved a vote of thanks to the chairman, deputy-chairman, and the other members of the committee, for their valuable services in fulfilling the duties of their office during the past year.

Sir CHAPMAN MARSHALL having borne his willing testimony to the zeal and ability displayed by the committee, the vote was carried by acclamation.

A vote of thanks was also passed to the auditors.

The members of the committee who retired by rotation were re-elected to that office for the ensuing year, Mr. Gray being re-appointed chairman, and Mr. Sangster deputy-chairman of that body.

Mr. TYRRELL said, a fitting opportunity now occurred for expressing their special thanks to Mr. Sangster; and he therefore begged to move, "That the announcement of the retirement of Mr. Sangster from the directions cannot be received without regret by the shareholders, who have so long enjoyed the benefit of his assistance; and they therefore express their best wishes for his health and happiness in his retirement; and, in addition, to thank him for his kindness in consenting to remain in office during their parliamentary campaign."

This was also carried by acclamation, and was briefly acknowledged by Mr. Sangster.

A vote of thanks having been unanimously accorded to Sir Charles Price, treasurer, the proceedings terminated.

ON THE POSSIBLE DENSITY OF THE LUMINIFEROUS MEDIUM;

AND ON THE MECHANICAL VALUE OF A CUBIC MILE OF SUNLIGHT.

By Professor WILLIAM THOMPSON.*

THAT there must be a medium forming a continuous material communication throughout space to the remotest visible body is a fundamental assumption in the undulatory theory of light. Whether or not this medium is (as appears to me most probable) a continuation of our own atmosphere, its existence is a fact that cannot be questioned, when the overwhelming evidence in favour of the undulatory theory is considered; and the investigation of its properties in every possible way becomes an object of the greatest interest. A first question would naturally occur, What is the absolute density of the luminiferous æther in any part of space? I am not aware of any attempt having hitherto been made to answer this question, and the present state of science does not in fact afford sufficient data. It has, however, occurred to me, that we may assign an inferior limit to the density of the luminiferous medium in interplanetary space by considering the mechanical value of sunlight as deduced in preceding communications to the Royal Society, from Pouillet's data on solar radiation, and Joule's mechanical equivalent of the thermal unit. Thus the value of solar radiation per second per square foot at the earth's distance from the sun, estimated at ·06 of a thermal unit Centigrade, or 83 foot-pounds, is the same as the mechanical value of sunlight in the luminiferous medium through a space of as many cubic feet as the number of linear feet of propagation of light per second. Hence the mechanical value of the whole energy, actual and potential, of the disturbance kept up in the space of a cubic foot at the earth's distance from the sun,* is $\frac{83}{192000\times 5280}$, or $\frac{\cdot 819}{10^7}$ of a foot-pound. The mechanical value of a cubic mile of sunlight is consequently 12,050 foot-pounds, equivalent to the work of one-horse power for a third of a minute. This result may give some idea of the actual amount of mechanical energy of the luminiferous motions and forces within our own atmosphere. Merely to commence the illumination of three cubic miles, requires an amount of work equal to that of a horse-power for a minute; the same amount of energy exists in that space as long as light continues to traverse it; and, if the source of light be suddenly stopped, must be remitted from it before the illumination ceases.† The matter which possesses this energy is the luminiferous medium. If, then, we knew the velocities of the vibratory motions, we might ascertain the density of the luminiferous medium; or, conversely, if we know the density of the medium, we might determine the average velocity of the moving particles. Without any such definite knowledge, we may assign a superior limit to the velocities, and deduce an inferior limit to the quantity of matter, by considering the nature of the motions which constitute waves of light. For it appears certain that the amplitudes of the vibrations constituting radiant heat and light must be but small fractions of the wave lengths, and that the greatest velocities of the vibrating particles must be very small in comparison with the velocity of propagation of the waves. Let us consider, for instance, plane-polarized light, and let the greatest velocity of vibration be denoted by v; the distance to which a particle vibrates on each side of its position of equilibrium by A; and the wave length by λ. Then if V denote the velocity of propagation of light or radiant heat, we have

$$\frac{v}{V} = 2\pi\frac{A}{\lambda};$$

and therefore if A be a small fraction of λ, v must also be a small fraction (2π times as great) of V. The same relation holds for circularly-polarized light, since in the time during which a particle revolves once round in a circle of radius A, the wave has been propagated over over a space equal to λ. Now the whole mechanical value of homogenous plane-polarized light in any infinitely small space containing only particles sensibly in the same phase of vibration, which consists entirely of potential energy at the instants when the particles are at the extremities of their excursions, partly of potential and partly of actual energy when they are moving to or from their positions of equilibrium, and wholly of actual energy when they are passing through these positions, is of constant amount, and must therefore be at every instant equal to half the mass multiplied by the square of the velocity the particles have in the last-mentioned case. But the velocity of any particle passing through its position of equilibrium is the greatest velocity of vibration, which has been denoted by v; and, therefore, if ρ denote the quantity of vibrating matter contained in a certain space, a space of unit volume for instance, the whole mechanical value of all the energy, both actual and potential, of the disturbance within that space at any time is $\frac{1}{2}\rho v^2$. The mechanical energy of circularly-polarized light at every instance is (as has been pointed out to me by Professor Stokes) half actual energy of the revolving particles and half potential energy of the distortion kept up in the luminiferous medium; and, therefore, v being now taken to denote the constant velocity of motion of each particle, double the preceding expression gives the mechanical value of the whole disturbance in a unit of volume in the present case. Hence it is clear, that for any elliptically-polarized light the mechanical value of the disturbance in a unit of volume will be between $\frac{1}{2}\rho v^2$ and ρv^2, if v still denote the greatest velocity of the vibrating particles. The mechanical value of the disturbance kept up by a number of co-existing series of waves of different periods, polarized in the same plane, is the sum of the mechanical values due to each homogenous series separately, and the greatest velocity that can possibly be acquired by any vibrating particle is the sum of the separate velocities due to the different series. Exactly the same remark applies to co-existent series of circularly-polarized waves of different periods. Hence the mechanical value is certainly less than *half*

---

* From the Transactions of the Royal Society of Edinburgh, vol. xxi. part I; through "Philosophical Magazine."

* The mechanical value of sunlight in any space near the sun's surface must be greater than in an equal space at the earth's distance, in the ratio of the square of the earth's distance to the square of the sun's radius, that is, in the ratio of 46,400 to 1 nearly. The mechanical value of the cubic foot of sunlight near the sun must, therefore, be about ·0038 of a foot-pound, and that of a cubic mile 560,000,000 foot-pounds.

† Similarly we find 15,000 horse-power for a minute as the amount of work equired to generate the energy existing in a cubic mile of light near the sun.

the mass multiplied into the square of the greatest velocity acquired by a particle, when the disturbance consists in the superposition of different series of plane-polarized waves; and we may conclude, for every kind of radiation of light or heat, except a series of homogenous circularly-polarized waves, that *the mechanical value of the disturbance kept up in any space is less than the product of the mass into the square of the greatest velocity acquired by a vibrating particle in the varying phases of its motion.* How much less in such a complex radiation as that of sunlight and heat we cannot tell, because we do not know how much the velocity of a particle may mount up, perhaps even to a considerable value in comparison with the velocity of propagation, at some instant by the super-position of different motions chancing to agree; but we may be sure that the product of the mass into the square of an ordinary maximum velocity, or of the mean of a great many successive maximum velocities of a vibrating particle, cannot exceed in any great ratio the true mechanical value of the disturbance. Recurring, however, to the definite expression for the mechanical value of the disturbance in the case of homogeneous circularly-polarized light, the only case in which the velocities of all particles are constant and the same, we may define the mean velocity of vibration in any case as such a velocity that the product of its square into the mass of the vibrating particles is equal to the whole mechanical value, in actual and potential energy, of the disturbance in a certain space traversed by it; and from all we know of the mechanical theory of undulations, it seems certain that this velocity must be a very small fraction of the velocity of propagation in the most intense light or radiant heat which is propagated according to known laws. Denoting this velocity for the case of sunlight at the earth's distance from the sun by v, and calling W the mass in pounds of any volume of the luminiferous æther, we have for the mechanical value of the disturbance in the same space,

$$\frac{W}{g}v^2,$$

where g is the number 32·2, measuring in absolute units of force, the force of gravity on a pound. Now we found above, from observation, $\frac{83}{V}$ for the mechanical value, in foot-pounds, of a cubit foot of sunlight; and therefore the mass, in pounds, of a cubit foot of the æther, must be given by the equation,

$$W=\frac{32\cdot2\times83}{v^2V}.$$

If we assume $v=\frac{1}{n}V$, this becomes

$$W=\frac{32\cdot2\times83}{V^3}\times n^2=\frac{32\cdot2\times83}{(192000\times5280)^3}\times n^2=\frac{n}{3899\times10^{20}};$$

and for the mass, in pounds, of a cubic mile we have

$$\frac{32\cdot2\times83}{192000)^3}\times n^2=\frac{n^2}{2649\times10^9}.$$

It is quite impossible to fix a definite limit to the ratio which v may bear to V; but it appears improbable that it could be more, for instance, than $\frac{1}{30}$, for any kind of light following the observed laws. We may conclude that probably a cubic foot of the luminiferous medium in the space traversed by the earth contains not less than $\frac{1}{1560\times10^{17}}$ of a pound of matter, and a cubic mile not less than $\frac{1}{1060\times10^6}$.

If the mean velocity of the vibrations of light within a spherical surface concentric with the sun and passing through the earth were equal to the earth's velocity—a very tolerable supposition—since this is $\frac{1}{10170}$ of the velocity of light, the whole mass of the luminiferous medium within that space would be $\frac{1}{30000}$ of the earth's mass, since the mechanical value of the light within it, being as much as the sun radiates in about eight minutes, is about $\frac{1}{15000}$ of the mechanical value of the earth's motion. As the mean velocity of the vibrations might be many times greater than has been supposed in this case, the mass of the medium might be considerably less than this; but we may be sure it is not incomparably less, not 100,000 times as small, for instance. On the other hand, it is worth remarking that the preceding estimate shows that what we know of the mechanical value of light renders it in no way probable that the masses of luminiferous medium in interplanetary spaces, or all round the sun, in volumes of which the linear dimensions are comparable with the dimensions of the planets' orbits, are otherwise than excessively small in comparison with the masses of the planets.

But it is also worth observing that the luminiferous medium is enormously denser than the continuation of the terrestrial atmosphere would be in interplanatery space, if rarified according to Boyle's law always, and if the earth were at rest in a space of constant temperature with an atmosphere of the actual density at its surface.* Thus the mass of air in a cubic foot of distant space several times the earth's radius off, on this hypothesis, would be $\frac{1\text{ lb.}}{442\times10^{345}}$; while there cannot, according to the preceding estimate, be in reality less than $\frac{1\text{ lb.}}{1560\times10^{17}}$, which is 9×10^{327} times as much, of matter in every cubic foot of space traversed by the earth.

* "Newton has calculated (Princ. iii. p. 512) that a globe of ordinary density at the earth's surface of 1 inch in diameter, if reduced to the density due to the altitude above the surface of one radius of the earth, would occupy a sphere exceeding in radius the orbit of Saturn."—Herschel's Astronomy, Note on § 559. It would (on the hypothesis stated in the text) we may now say occupy a sphere exceeding in radius millions of millions of times the distances of any stars of which the parallaxes have been determined. A pound of the medium, in the space traversed by the earth, cannot occupy more than the bulk of a cube 1,000 miles in side. The earth itself, in moving through it, cannot displace less than 50 pounds of matter.

REPORT OF THE SALFORD GAS COMMITTEE FOR THE YEAR ENDING AUG. 31, 1854.

TO THE COUNCIL OF THE BOROUGH OF SALFORD.

Gentlemen,—Your committee, in presenting their annual report, have to state that the consumption of gas and the gas rental exceed those of any year during which the works have been in the possession of the corporation.

They have, further, the pleasure of reporting that, notwithstanding the advanced price of cannel, the profits for the past year show an increased per centage on the rental.

The total quantity of gas made during the year ending Aug. 31, 1854, is 107,902,700 cubic feet. In order to produce the above quantity, 9623 tons 9 cwts. 1 qr. of cannel, and 427 tons 13 cwts. 2 qrs. of coal, were used. The gas rental for the year amounts to £22,487. 13s. 8¼d.

The preceding figures show an increase over those of the period embraced in the last report of 6,520,630 cubic feet of gas made, and of £1774. 1s. 11½d. of gas rental. The cannel used during the former period was 10,065 tons 4 cwts. 2 qrs.; and the quantity of cannel and coal used during the past twelve months was 10,051 tons 2 cwts. 3 qrs.

Your committee beg to draw attention to the following tabular statement of results:—

Period.	Quantity made in Cubic Feet.	Amount receivable for Gas. £ s. d.	Average per Ton.	Average Amount received per 1000 Feet passing the Station Meter.
			Cubic Ft.	d.
Year ending June 30, 1852	87,552,600	17,041 13 8	10,107	46·71
14 months, ending Aug. 31, 1853..	101,382,070	20,713 11 9	10,072	49·03
Year ending Aug. 31, 1854	107,902,700	22,487 13 8¼	10,730	50·

From the foregoing statement, it appears that not only has the production from every ton of cannel increased, but the average amount received for every 1000 cubic feet of gas is also greater than heretofore. This latter result has been obtained by a more careful attention to the meters of the consumers, and a decreased leakage consequent on the enlargement of mains.

Your committee have to state that a reduction in the prices received for the tar and ammonia water made on the works has occasioned a diminution in the receipts on those items of about £270 on the quantities produced.

Your committee, during the past year, have made an additional contract for 8000 tons of the best Wigan cannel, which, with the balance left undelivered of the contracts made for 24,000 tons the preceding year, will, they expect, enable them to meet the wants of the gas works, without going into the market for a further supply, till the spring or summer of 1856.

Your committee would observe, that, though the average price per ton of these contracts is 35 per cent. greater than was paid up to the beginning of the year 1853, it is about 40 per cent. below the present market price.

Your committee, having found by experience during the past year that it would be necessary to provide a stock of cannel in the summer to meet the requirements of the winter months, have erected a shed capable of holding upwards of 2000 tons.

The cost of this important addition to the works, which involved the removal of the manager's house, will be under £500, after deducting the amount realised by the sale of the old materials.

The attention of your committee having been drawn to the necessity of providing increased gas storage, they, after due consideration, determined to telescope the 89-ft. single gasholder, by which an additional storage will be obtained of 156,000 cubic feet. The cost of this addition will be about £2000.

Your committee have, during the past year, made other necessary but less costly extensions.

Your committee are supplying the out-districts of Eccles, Patricroft, Barton, Peel-green, and Monton-lane; and are also laying the mains necessary to light the villages of Pendlebury and Swinton.

In the course of the past year your committee have laid very nearly eight miles of additional mains, and upwards of three miles of old mains have been taken up, and others of a larger diameter substituted. For the particulars of these extensions and substitutions, they refer the council to the list appended to this report.

The number of new services laid during the past year is 467. The requisite services have also been laid to such new street lamps as have been required within the several districts of the borough.

In order to provide for the wear and tear of the works, your committee decided to appropriate a sum amounting to 2½ per cent. per annum on the invested capital, as a reserve fund for depreciation.

After appropriating £1103. 19s. 10d. to this fund, and the payment of £2487. 18s. 7d. to the finance committee, for interest at the rate of 5 per cent. per annum on the invested and floating capital, the net profits for the year amount to £9336. 10s. 5½d., which amount will be apportioned as follows:—

			£	s.	d.
To the Salford district of the borough			£7,067	9	4½
„ Pendleton	ditto	.....	1,446	10	4
„ Broughton	ditto	.....	822	10	9
Total			£9,336	10	5½

EDWARD WRIGLEY, Chairman.

Gas Works, Salford, Oct. 30, 1854.

RECEIPTS AND EXPENDITURE OF THE SALFORD GAS COMMITTEE, FROM AUGUST 31, 1853, TO AUGUST 31, 1854.

RECEIPTS.

To balances at August 31, 1853			£ 3,330 7 5
Revenue Account.			
Gas rents received	£22,479 17 10½		
Gas rents outstanding August 31, 1853	1,888 10 9½		
	24,368 8 8		
Less gas rents outstanding August 31, 1854	2,098 2 5		
		22,270 6 3	
Coke sold	1,020 19 0½		
Gas tar ditto	401 0 2½		
Ammoniacal liquor ditto	220 3 1		
		1,642 2 4½	
Meters and meter-boxes sold		1,151 10 6	
Old iron sold	151 1 3		
Burners sold	2 8 6		
Fines, summonses, &c.	2 0 0		
		155 9 9	
Interest allowed by bankers, less commission	10 7 1		
Ditto on mains in the out-townships	20 10 11		
		30 18 0	
Extensions.			
Proceeds of sale of materials of manager's house		72 9 0	
Salford district finance committee—additional capital for extensions of works		6250 0 0	
		£31,903 3 3½	

EXPENDITURE.

Revenue Account.			
Salaries—			
Manager.....H. Brothers, twelve months	£ 227 10 0		
Collector.....S. Long, ditto	260 8 5		
Office clerk ...J. Wm. Betteney, ditto	88 1 6		
Gas-works clerk, and inspectors of meters, ditto	228 12 0		
		£ 804 11 11	
Workmen's wages—			
Gasmen	1,482 0 3½		
Bricklayers, &c., at retorts	83 10 7		
Labourers at the work	623 1 6		
Labourers at lamp-pipes	18 5 9½		
		2,206 18 2	
Cannel	6,147 17 11		
Lime	167 7 1		
Meters and boxes	1,064 7 4		
Iron-work and castings for works	94 3 11		
Clay retorts	455 3 4		
Fire bricks and fire clay	156 2 9		
Repairs of streets	34 0 3½		
Casual expenses on works	109 19 10		
Repairs of telescope gasholder	10 9 8		
		8,239 12 1½	
Oil, paint, and painting	15 15 0		
Repairs of water committee's pipes	0 12 9		
Expenses on manager's house	10 14 9		
Water rent	96 6 7		
Repairs of implements	93 9 0		
Printing, stationery, and advertising	121 13 2½		
Cement	1 7 2		
Furniture for offices	1 2 6		
		341 0 11½	
Rates and taxes		483 5 6½	
Property-tax	£240 14 9		
Less received from Le Gendre N. Starkie	4 2 10		
	236 11 11		
Chief rents	279 18 10		
Less received from Townhall committee	91 7 10		
	188 11 0		
		425 2 11	
The Salford district finance committee, one year's interest on capital		2,518 16 7	
The Salford district improvement committee, moiety of profits to Aug. 31, 1853	4,126 18 9		
The ditto finance committee (sinking fund) do. do.	4,126 18 9		
		8,253 17 6	
Depreciation reserved fund account, 2½ per cent. on value of gas works, as per last report, viz., £44,159. 11s. 2d.		1,103 19 10	
Extensions.			
Extensions of retort-house	57 16 10		
Station meter-house	1 14 6		
New purifiers and house	127 18 3		
Iron main and service pipes	7,725 13 2		
New retort-bed and connections	419 3 3		
New tar-well and condensers	282 7 11½		
New tar-stage and pumps	52 7 11		
New lime-shed	40 11 0		
New cannel-shed	189 13 2		
New retort-house	4 12 0		
Telescoping gasholder	49 8 4		
Implements	22 14 0		
New purifying-house	3 18 0		
New weighing-machine	0 9 0		
New workshop	2 11 6		
New pipe-shed	12 9 0		
		8,993 7 10½	
Balances at Aug. 31, 1854, viz.:—			
Balance in the Bank	3,174 10 0		
Balance of cash on hand	219 13 5		
	3,394 3 5		
Less sums owing by the committee 5,824 19 2			
Sums owing to the committee 3,963 5 7½			
	1,861 13 6½		
		1,532 9 10½	
		£34,903 3 3½	

GAS WORKS' DEPRECIATION FUND ACCOUNT, AUGUST 31, 1854.

To one year's charge for depreciation in value of gas works, at Aug. 31, 1853—say £44,159. 11s. 2d., at 2½ per cent.		£ 1,103 19 10	
		£1,103 19 10	
Balance down		£929 4 5	
By replacements of street-mains and service-pipes		£ 174 15 5	
Balance down		929 4 5	
		£1,103 19 10	

SALFORD GAS COMMITTEE STOCK ACCOUNT, AUGUST 31, 1854.

ASSETS.

Gas works and plant, as per last report, at Aug. 31, 1853		£44,159 11 2	
Add outlay during the year, viz.:—			
Extension of retort-house	£ 57 16 10		
Station meter-house	1 14 6		
New purifier's house	127 18 3		
Iron main and service pipes	7,725 13 2		
New retort-bed and connections	419 3 3		
New tar-well and condensers	282 7 11½		
New tar-stage and pumps	52 7 11		
New lime-shed	40 11 0		
New cannel-shed	189 13 2		
New retort-house	4 12 0		
Telescoping gasholder	49 8 4		
Implements	22 14 0		
New purifying-house	3 18 0		
New weighing-machine	0 9 0		
New work-shop	2 11 6		
New pipe-shed	12 9 0		
	8,993 7 10½		
Less materials of manager's house sold	72 9 0		
		8,920 18 10½	
		53,080 10 0½	
Floating Assets.			
Gas-rents outstanding Aug. 31, 1854		2,098 2 5	
Sundry debts owing to the committee		3,963 5 7½	
Sundry materials on hand		2,905 1 0	
Balance in the Bank, Aug. 31, 1854		3,174 10 0	
Balance of cash in hand, Aug. 31, 1854		219 13 5	
		12,360 12 5½	
		£65,441 2 5½	
Balance brought down—excess of assets		59,616 3 3½	

LIABILITIES.

Sundry debts owing by the committee	£ 5,824 19 2
Balance of assets	59,616 3 3½
	£65,441 2 5½

MR. FLINTOFF AT BOSTON.

A public meeting was held in the Guildhall, on Thursday, the 11th ult., for the purpose of considering the propriety of forming a new gas company, and to hear an address from Mr. Geo. Flintoff, of Liverpool, on the science of gas manufacture.

F. Cooke, Esq., mayor, occupied the chair. Amongst those present we noticed Messrs. Wren, Simonds, J. Elsam, S. H. Jebb, F. T. White, J. Noble, T. Cunningham, Hobson, W. Lewin, T. Storr, T. Wise, G. Snaith, &c. &c. The large room was crowded.

The Chairman, on opening the business, remarked that he appeared before them as chief magistrate, having called the meeting at the request of several influential gentlemen, who wished to form a new gas company. He had no observations to make relative to the old company, but merely presided over the meeting as mayor. He trusted that an impartial hearing would be given to all parties who might address them. With these preliminary remarks, he would call on Mr. Flintoff, of Liverpool, to give them an exposition of his experience.

Mr. Flintoff, on rising, said he wished it to be distinctly understood that he did not appear as an opponent of the gas company then in existence, neither had he any wish to depreciate their property. He appeared before them that evening to give information relative to gas; whether any method could be adopted to obtain it cheaper. A number of highly respectable gentlemen in the place, conceiving that gas should be more moderate in price, as well as better in quality, had requested him to visit the borough, to give an explanation of his experience; a request to which he had cordially acceded. Those gentlemen, he might say, had actually formed a new company; for they had subscribed, in a very short space of time, no less than £6600, almost as much as the capital of the old company. There could, then, be no difficulty in their succeeding. The promoters of this movement had deemed it right to call that meeting, in order to give their opponents an opportunity to attend and discuss the question. If they could show that they were supplying gas as cheap and as pure as they could, then the originators of the new company would retire from the field; but if, on the other hand, it could be shown that local circumstances favoured this town in supplying gas cheaper, then they were in duty bound to unite together for the purpose of carrying out so desirable an object. He had advocated similar movements in larger towns, and the principle was, that a number of consumers combined together, who could obtain gas at a much cheaper rate than was supplied to them by a body of men who formed companies for mere trading purposes. In other places in which the principle was fairly in operation, the subscribers were receiving from 7 to 7½ per cent. interest upon their outlay; so that he did not appear before them with any new-fangled notions; the principle was fairly in work, and had been proved eminently successful. It was likewise an established fact, from parliamentary papers, that gas could be produced in towns like Boston at 3s. 2½d. per 1000 cubic feet. The price of the raw material, from which they supplied the gas, and the expense of labour, differed very little. According to their own paper, the gas supplied in that town did not cost the company one penny. There was not the slightest doubt the pipes, machinery, &c., belonging to the old company, were of so inefficient a character, that they were not in a position to meet the requirements of the consumers. In 1850, Mr. Hume moved for parliamentary returns of the capital subscribed by every existing company, from which it appeared that the capital of their opponents amounted to £8000. Now, the old company procured their coals at 18s. per ton; and he found from their own bill that in December last they charged 8s. for half a ton of coke, at the rate of 16s. per chaldron; the tar produced from a ton of coals would be worth 1s. 3d.; and the ammonia water, 6d.: making 17s. 9d. out of every 18s. they expended. This was one of the reasons why the promoters of the new company conceived that gas ought to be cheaper. It had been endeavoured to be shown by those who had vested their capital in gas companies, that wherever coals were dear, gas must necessarily be high in price likewise. This argument was false, as had been testified in various important towns in the country; for it was well known that in those places where coals were dear, coke was also at an extravagant rate. It is now thirty years since gas was introduced into this country by the father of gas reform, Mr. Clegg, who put gas across London-bridge. On that occasion, he could not get persons who had pluck enough to light the lamps, they foolishly believing that it would blow the town to atoms. The groundlessness of their fears was, however, quickly shown, by the inventor pricking a hole in the pipes. But to revert to the subject more immediately under consideration, they wished to show the meeting how to get the best light at the smallest cost. This great desideratum, they might feel assured, could only be accomplished by the introduction of competition. If they did not support the present movement, the monopoly now in existence would be carried to a still greater extent. There was one important fact, apparently not generally known, of which he was anxious they should be made acquainted. It was invariably considered by the consumer, that if his gas was bad, he had not so much to pay for it. This was an incorrect conclusion, because impure gas registered just the same as pure, and their bills would be precisely the same in amount. What he contended was this—if the consumers of gas in this borough could procure a better article, at a less cost, they would be very blameable if they did not do so. How, he asked, had the Boston company behaved to the consumers? Why, in addition to 10 per cent. interest, he was credibly informed they paid bonuses. If any unconcerned person would look over the company's works, they would find that they must have expended £12,000 or £13,000. It was clear, therefore, that enormous profits must have been obtained. The company existing at Burnley returned a capital of £8000; yet, in reality, it then amounted to about £18,000, the unreturned sum having, as they admitted, been made out of the public. Such (villainy, he was about to say, but he would not use so harsh an expression)—such a state of things ought not to be allowed to exist.

F. T. White, Esq., rose to order. He called upon the learned gentleman to retract the expression he had just made use of.

Mr. Flintoff continued: He did not then allude to the Boston Company; he referred to the town of Burnley. In many towns in this country, gas did not cost more than 3s. per 1000; and he would tell them that they had no right to inquire how it was. It was sufficient to know it existed; and, if they could obtain it at a similar rate in Boston, they ought to do so. If, however, they continued to support a monopoly, they would be taxed as long as possible. In order that the public might be made acquainted with this subject, some time ago the Commissioners of Woods and Forests issued a calculation made by Lord Morpeth, that the cost of gas, including all expenses, where the annual consumption amounted to 30,000,000 feet, was not more than 3s. 2¾d. per 1000 feet; while in Boston they were, he understood, paying 6s. Those figures had been worked out to suit Boston, and it had been found that the consumers ought not to be paying more than 3s. 2½d. per 1000; that was, providing they could get the consumption. The speaker here alluded to the town of Chester, which, he said, contained a population little more than Boston, where there were two companies in existence. The price of gas had been much reduced since the formation of the new company; yet, in spite of this competition, the old shareholders were receiving 12½ per cent. instead of, as before, 10 per cent. He believed if, after the formation of a new company in Boston, the present company would do away with their old machinery and antiquated notions, they would be in a position to produce gas at a much cheaper rate. It was his confident belief, that 30 per cent. was lost in the town through leakage, arising from the ineffective state of the machinery, pipes, &c. Such being the case, how was it possible that they could compete with a new company, the shareholders of which would introduce machinery of a much more economical and scientific character, by which they could provide gas one-third cheaper than the old company. The existing company had no right to be receiving such enormous profits. If it was good to have free trade in one thing, it was in everything; gas ought not to form an exception. The public had no right to be cheated in such a way.

Mr. White again rose to order. He could not quietly submit to the term "cheating" being applied to the Boston Company.

Mr. Flintoff would not make an assertion which was not strictly true. The learned gentleman who had interrupted him might be very sensitive, but he was exceedingly silly. The new company proposed to let them have gas at 4s.; it would be composed of shares of £10 each; consumers could take their own shares, and conduct the business themselves. If they would carry out this principle to a greater extent, they would upset all aristocrats, and those who would interfere with the free expression of their thoughts. The Commissioners of the Paving Trust, who, he presumed, were the reflex of of the opinions entertained by their fellow-townsmen, would no doubt allow the new company to lay down their pipes. If the old company opposed them, they would be defeated, as would likewise be the case if they were opposed in Parliament. The inhabitants of Boston, by establishing another company, would procure a necessary of life at a much cheaper rate than they had been receiving it. It might be said, that there would be difficulty in forming one without an act of Parliament; but let him tell them there were 682 gas companies in existence, of which number only 157 had, of his own knowledge, acts of Parliament. So that, if they would only unite, they must make it remunerative. If they did not therefore destroy this monopoly, they would suffer for years to come. Even supposing the old company were to lower their charges, it would be of no advantage to the consumers; for the miserable light which was then exhibited in that room, fully proved that there was not sufficient power. The inhabitants were told that the public lamps consumed 5 feet per hour; but such was not the case. At 10 o'clock at night down went the lights; at 11 o'clock a similar process was enacted. Last night, he (Mr. Flintoff) was a late bird, and had therefore an opportunity of witnessing the fact. Gas produced from such coals as were supplied in Boston, ought to produce lights equal to 13 sperm candles; but it had been ascertained, by fair experiments, that the public lamps in the town only equalled 8¼. These things, however, would be remedied by competition, as had been the case at London, Burnley, and other places. Mr. Flintoff resumed his seat amidst great applause.

Mr. W. Simonds rose to propose the first resolution. In doing so, he said the complaints made against the company relative to the ineffectual state of the gas, were loud and of long duration; notwithstanding which the grievance had not been remedied. He had no doubt that there were several gentlemen round him connected with the old company who would have met the requirements of the times, if they had had sufficient power; but they were prevented from so doing by others who said, "We will have our dividends; they cannot get another company." He was himself a small reformer in gas, and in furtherance of this object he had attended several meetings of the Lighting Commissioners: the company could not say they were unaware of the complaints. He had repeatedly complained of the gas, but he had been laughed at for his pains. That, however, was not a place for recrimination. He had no doubt whatever that a lot of small proprietors overruled the more liberal shareholders; but this was not the fault of the new company; warning had been given long enough. It was, he confessed, a great pity that one company was not sufficient. He cordially moved the following resolutions:—

"That a company for supplying pure gas at a maximum price of 4s. per 1000 feet, to be called 'The Boston and Skirbeck New Gas Company,' be formed on a mutual principle, which shall constitute an identity of interest between the producers and their customers, in which the profits shall be returned to those who create them as consumers in reduction of price, after payment of a dividend, not exceeding 10 per cent.—That the capital shall be £10,000, to be divided into shares of £10 each, with power to increase their capital to £15,000; and that each person applying for shares shall pay a deposit of 1s. per share.—That the following gentlemen be a provisional committee, with power to add to their number; three of whom shall be competent to act, and carry out the resolutions of this meeting, viz.:—John Elsam, Esq., J.P.; H. Ingram, Esq.; J. C. Little, Esq.; J. F. Smythe; Jas. Smith; Wm. Simonds; Jos. Wren.

Mr. J. Wren, in rising to second the proposition, said a new company had been long wanted, and it had come at last. He had spoken to the officials of the old company in reference to the deficient lighting; especially at half-past three in the afternoon, and even at eleven o'clock at night. In reply, he was told that the former time was too soon to commence; and that he had no right to be at business so late as eleven (laughter). He had great pleasure in seconding the resolution.

Mr. F. T. White, clerk to the Boston Gas Light and Coke Company, said, that he had attended the meeting by the direction and on behalf of the committee of management, together with several members of the committee, with the view of laying briefly before the town such information as the inhabitants and consumers generally were entitled to receive with reference to the present state and prospects of the company, and the means they possessed of meeting the public consumption of gas. After adverting to the somewhat unusual course which had been taken in convening the meeting without any formal requisition, Mr. White stated that he was happy to find the gentleman (Mr. Flintoff) who had addressed them that evening, did not profess to appear in a hostile position against the company, although certainly some of the expressions he had made use of, as a perfect stranger to those whom he had taken the liberty of animadverting upon, might seem, at first sight, to bear a different construction. The Company which he had the honour to represent, had been established thirty years ago, by a body of gentleman residing in the town, perfectly well acquainted with the wishes and requirements of the borough and port of Boston, whose names he need scarcely advert to. They were set forth in the act of Parliament, which was well known to them all, and comprehended most of the leading inhabitants at the time of the establishment of the undertaking. It was perfectly true, as had been well and ably stated by the gentleman to whom they had listened, that since that time the art of lighting by gas, and the manufacture of gas, had been, in various ways, considerably improved; and, without at all disputing or attempting to enter into details upon these points, he was authorised to admit that the present appliances and apparatus of the company were not altogether so complete as the commiitee themselves were anxious they should be to meet the rapidly-increasing wants and consumption of the town, which, in several forms, as to the public lights, the large additional demand in private houses, and also for cooking purposes, had increased in a degree which far exceeded the existing means of supply, and had, for some time, engaged the attention of the company; and the the provisions which the committee of management had from time to time made, were only in connection with further improvements which they had in contemplation. (Hear, hear.) Still, it was not proper or correct to represent their works as altogether of the imperfect and antiquated description which some of the preceding speakers had endeavoured to attach to them. Nothing was more easy than to attempt to appeal to those elements of dissatisfaction which always would exist in reference to any public body, however well conducted. He was, however, distinctly authorised to state, on behalf of the company, that they had turned their attention to the propriety of still further enlargements and improvements of the works, and of adding to their power of making and storing gas, already very considerably increased, especially within the last ten years; and this fact, he submitted, ought to entitle the company to the confidence and support of the town generally, as it certainly would in applying to Parliament for the requisite extension of those powers which they had now enjoyed, and exercised most beneficially for the town, for so many years. More immediately, however, in reference to the present meeting, he (Mr. White) would state that the committee of management had resolved "That a special general meeting of the shareholders be convened, on a day to be named, to take into consideration the affairs of the company generally, and in reference to the projected new company especially; to consider the propriety of applying to Parliament to obtain increased powers, enabling the company to raise additional capital for the extension and improvement of the works, by the issue of additional shares;" and "that the new shares be allotted to such of the principal consumers of gas as may be disposed to accept them, care being taken to secure the equitable interest of the present shareholders." These were substantial, business-like resolutions, and the company had decided to carry them into effect, by first instituting a complete examination and survey of the state of the existing works, with the intention of maturing such a plan as he (Mr. White) felt persuaded would meet with the sanction of Parliament, and answer the purpose which all attending that meeting were desirous of seeing accomplished: viz., furnishing to the public a supply of gas, in a purer state, he admitted, than, owing to more than one unfortunate accident at the works, they had at all times been in a situation to supply, and upon as moderate terms as would ensure at once a practical working company, and meet the wants of the town. With reference to the extremely minute calculations in which the gentleman who had addressed the meeting had indulged as to the price at which gas could be manufactured, upon the authority of parliamentary returns, descending so low as to one-eighth of a penny, he (Mr. White) maintained, at once, that such minute theoretical calculations had no bearing whatever in practice, and had no relation to the price and quality of coal, which were continually varying — particularly to the gas-producing powers of the coal, which depended upon the means of transit and other causes, even supposing the coal to be all originally equally good, which could not be the case. He rather thought also that that gentleman (Mr. Flintoff) had left the cost of the plant and working apparatus out of his calculations. When, therefore, that gentleman presumed to put into his (Mr. White's) mouth such words as these which he (Mr. White) had taken down (after admitting, however, that he (Mr. Flintoff) was apt to get warm, the truth of which he had certainly proved), that "the company are determined to go on taxing as much as possible, and no doubt this gentleman (meaning Mr. White) would be ready to justify it:" he (Mr. Flintoff) stated what was not the fact; and if he (Mr. White) were at liberty to do so, he could even more decidedly than at present satisfy the meeting that such a course had never been advocated by him, and was one which he did not approve. What the company did say was this:— Admit such of the principal consumers and inhabitants interested as may feel disposed to amalgamate with the present company, and to improve, as far as possible, its means of working; without that competition, or rivalry, which, they believed, in such an instance as this, and with the existing population of the town, would not be found ultimately to promote either the public or private advantage. And so far from increasing the price or taxation, he (Mr. White) was at all times anxious rather to lower it, but certainly not to the extent, or anything like the extent, of those visionary theories which might command the applause of the moment, but were of no practical value. These observations he had submitted on behalf of the company, who were entitled to consideration at the hands of the town on account of the capital which they had embarked in their works, of considerable and increasing extent; and which they were, either there, or in committee of the Houses of Parliament, prepared and determined to defend. (Hear.)

Mr. Simonds, after apologising for again rising, said that the meeting had just heard from the learned gentleman—the clerk to the gas company—that Mr. Flintoff had come to illuminate the town; but why did they not improve the system some years ago? The company, now it was too late, would appear to be very liberal; they would make extensive alterations when they were driven to do something. It was no philanthropy on their parts. They had taken 13 per cent. out of the pockets of consumers.

Mr. J. Noble: It is not true.

Mr. Simonds continued: His noble friend (Mr. Noble) had taken the chair at public meetings often enough to know that each person had an opportunity of replying without interrupting a speaker. It was a well-known fact that the company had gone on increasing their interest until it had reached 13 per cent. The original £50 shares had been reduced by bonuses to £38; yet they were now paying £5 and £6 on their reduced capital of £38. There were five shares in the market, the value of which, he had no doubt, would shortly be reduced.

Mr. G. Snaith considered that the tone adopted by Mr. White was far from respectful towards his worship, who was perfectly justified in calling that important meeting together without a requisition being got up for the purpose. It was, he had no hesitation in saying, the best meeting that had ever been held in that room, as it was composed of persons of all political parties, assembled together for one common object. The language adopted by Mr. White did to him seem to be a reproach upon the mayor, for having shown too great an eagerness to preside on the occasion. The clerk to the old company admitted that they had not the proper machinery to meet the requirements of the present day: they could not have better authority than Mr. White. During the past few years it was an undeniable fact that great and important improvements had been made in the manufacturing districts in machinery applicable for gas purposes, which would not only decrease the expense of working, but permanently improve the gas. It was not so much the price that was complained of by tradesmen; but, because the light was so impure, they could not get supplied according to their wishes. The first thing that struck the attention of strangers who entered the town was the lighting, nearly every one exclaiming how defective it was in comparison with other towns of similar importance. In the early part of the evening it was supplied in greater quantity than late at night, when it was essentially necessary. It had been said that the old company were going to use their great powers for the benefit of the public; but how was it they had only just acknowledged it? He congratulated the originators of this movement in favour of cheap gas, upon the fact that £6000 had been already subscribed—a circumstance which, combined with the promises of support they had received from other quarters, formed ample guarantees that the new company would be carried out in its integrity. It was highly desirable that the company should be formed, and it was pleasing to find that gentlemen came forward with such spirit to promote the object in view. One thing, he thought, must satisfy the most sceptical of the necessity of this movement: that no attempt had been made to refute the assertions of those who had originated that meeting.

Alderman Noble said he probably should not have addressed the meeting had he not been appealed to by Mr. Simonds. It was true, he had frequently, as Mr. Simonds observed, been chairman at meetings in that hall, and he had sometimes had to call him to order: he liked to give a Roland for an Oliver. On the present occasion, he was glad the projectors of the new gas company had called a public meeting, as it would afford opportunity of explanation. True, he felt himself in a position somewhat unusual, for he had the misfortune to be connected with that wicked monopoly, the "Boston Gas Company," of which he was one of the original shareholders, though his stake in the concern was but small. He congratulated his friend, the mayor, on his conversion to free trade, and his opposition to monopoly—("hear," and laughter)—and he could imagine that, on a forthcoming great occasion, when the "North Lincolnshire Agricultural Society" would, in July next, dine in the large hall of the New Corn Exchange, his worship in the chair, he would, on the toast being proposed, "Success to Agriculture"—[A Voice: "No politics—question"]—address the assembly as follows:—"Gentlemen, I am glad to meet you here this day; I confess I have long cherished Protectionist opinions, but I now see they are a great fallacy, and I confess myself a convert to free trade." (Cries of "Gas, gas," laughter, and confusion.) Well, then, he (Mr. Noble) would talk about gas; but he must say that the proceedings had hitherto been somewhat irregular. Mr. Simonds had stated what was not correct, in reference to a dividend of 13 per cent. On the original share 10 per cent. was paid; but many of these had changed hands; and, as £80 had been paid for some of these, the present holders only obtained about 5 per

cent. [Mr. J. Hobson: "But you've got the profit."] (Laughter.) What was that to the present holders? Then, as to Mr. Simonds' remark about part of the £50 having been paid off, reducing the shares to £38; it was, like many other statements made in reference to the old company, contrary to the fact. The sum first raised as capital was £6000, increased by additional shares to £8000; and to meet a deficiency, to enable the company to complete the works, £10 per share was advanced by the shareholders, who were afterwards repaid: and was not that right and proper? He denied the charge of monopoly, the prices having been reduced from time to time, entirely without solicitation, from 12s. 6d. to 5s. per 1000 cubic feet. And in proof that the quality was not so bad as had been represented, he could even refer to the lights before them; indeed, he had no hesitation in saying, from personal observation, that the street lights in Boston were far superior to those in Liverpool, Manchester, Edinburgh, Glasgow, or York. (A laugh from Mr. Simonds.) In many instances where the gas was bad, it was not from a deficiency in the supply, but through the pipes being corroded. The company, too, were determined to go on improving their establishment, as already stated. Nor were their works so "antiquated" as had been represented, for numerous improvements had been from time to time introduced, among which might be mentioned the new gasometer, on the newest and most improved construction, unequalled in this or adjoining counties. It was certainly correct that the company expended a considerable sum in improving their works; but were they blameable for that? They had not a single unnecessary building or apparatus. Were they not bound to keep the works in working order? It had also been asserted that, by an arrangement with the company, the Great Northern Company were receiving their gas at a much cheaper rate than the public generally were.

The Chairman: I beg your pardon; no such assertion has been made in this room, to which you should confine your remarks.

Mr. Noble: These reports had been industriously circulated throughout the town, but there was not the slightest foundation for them. The Great Northern Company fixed their own price. Complaints had been made of the deficiency in quantity of the gas supplied; but the meeting must be aware of the unforeseen accident which happened last year to the second largest gasometer, which even now rendered it necessary to have it out of use for repair. In a fortnight it would be completely restored, when an abundant supply of gas would be given to the town. No one could avoid accidents, and last year the inhabitants and lighting commissioners were extremely forbearing. He concluded by recommending the projectors of the new company to unite with the old one, by which they might take their share in the management, which would, he suggested, be all they could reasonably desire. He would recommend Mr. Wren and others to take shares in the Athenæum, otherwise it would be lost.

Mr. Wren: I dare take as many as you have in the old company.

Mr. Noble: Well, do so; I have only one share. You would not have had the water if it had not been for Nottingham.

A Voice: Gas, gas! Question!

Mr. Wren: The very gentleman who supported that project has taken 150 shares. I mean, Herbert Ingram, Esq., of London.

Mr. Simonds: I spoke to the engineer about the defective lights in my house after ten o'clock, when his reply was, that I had no business to sit up so late. (Laughter.)

Mr. Lewin: It was, Mr. Simonds is aware, spoken in a jocular manner.

Mr. Wren: I beg to say it was not spoken jocularly.

Mr. Lewin: Then I beg to repeat, it was. It is nonsense to talk such absurdities.

Mr. Simonds: It seems, from what the clerk of the old company has said, they are going to have an eminent engineer down to report. I trust they are not going to cast any reflection upon the present engineer, who is receiving £10 per year for his services.

Mr. Lewin: I deny it; it is ridiculous.

Mr. Simonds: I am informed that is the amount. What do you receive, then?

Mr. Lewin: You don't think I am going to tell you. Gentlemen should not make assertions without proof.

Mr. Simonds then stated that the company would be carried on similar to mutual societies, each person taking shares according to his means.

The Chairman felt exceedingly surprised that two gentlemen, respected friends of his, should have taxed him with calling together that meeting. He had, during the period he had had the honour of presiding as their chief magistrate, endeavoured to act with the strictest impartiality—a course which, he trusted and believed, was in consonance with the feelings of his fellow-townsmen. When he was waited upon by a gentleman of the highest respectability, who assured him that a capital of £6000 was ready to be put down towards the formation of a new company, he did not, bearing in mind that the whole capital belonging to the old company only amounted to £8000, hesitate in the course he ought to pursue. His worship, after reading the resolution proposed, put it to the meeting, when it was carried by an overwhelming majority, only five hands being held up against it.

A vote of thanks to the mayor for presiding over the meeting was carried with three times three.

Deputation to Sir Benjamin Hall.—A deputation of gas companies of the Surrey portion of the metropolis had an interview, on the 8th inst., with Sir Benjamin Hall, President of the General Board of Health, at his office, Whitehall, on the subject of the bill now before the House of Commons for dividing the south side of the Thames into four districts, to be supplied by the four undermentioned companies:—Messrs. Morris and Pridden, from the Phœnix Gaslight and Coke Company; Messrs. Upton and Livesey, from the South Metropolitan Gas Company; Messrs. Maynard and Hinde, from the London Gas Company; and Messrs. Pococke, James, and Boddy, from the Surrey Consumers' Gas Association. They were accompanied by Mr. Hall, Parliamentary agent.

Destruction of the Brussels Theatre.—It has been reported that the deplorable conflagration by which this establishment was destroyed, originated in an escape of gas. A rigorous investigation has taken place, the result of which has been fully to exculpate the gas from any charge in connection with the accident.

Newhaven (Sussex).—This town has been recently lighted with gas, by Messrs. Squire and Co., of Dover-street, London. The works were carried out under the superintendence of Mr. Mead, and are stated to be in every respect most complete. Messrs. Squire and Co. have guaranteed that the dividend shall not be less than 5 per cent., and have taken the Grays Thurrocks Gas Works on the same conditions.

Southampton.—The Gas Company are about to extend their mains in the district of Newtown, including St. Mary's-road, Brunswick-place, Dorset-street, Park-street, Berely-road, Onslow-road, Fanshawe-street, Lyon-street, Bullar-street, Alfred-street, Rockstone-lane, and the neighbourhood of the College. Also to Duke-street and Charles-street, in the locality of the Saw Mills, and on the Western Shore-road to Blechynden. They are also about to erect a Gasholder at the back of their new works, to contain 150,000 cubic feet of gas. Its diameter is 91 feet, and the contract for it has been taken by Mr. Thomas Piggott, of Taylor's Dock, near Birmingham.

The Harwich Gas Works.—These works are now completed and in operation. They are an important addition to the improvements that have been recently carried out in this town, and will, no doubt, be a great convenience and comfort to the inhabitants. On Friday evening the town was lighted with gas for the first time, and its appearance was both pleasing and brilliant, especially when contrasted with the previous gloom. The inhabitants, naturally, were all life and bustle, and the worthy Harwichers appeared determined that the evening of first lighting up, which had been so long looked for, and so joyfully hailed, should not pass unnoticed. The bells of the church rang merrily, and the local brass band was put in requisition to celebrate the first illumination. The works were erected from the plans and under the superintendence of Mr. Jabez Church, C.E., who has had to encounter considerable difficulty, especially in the foundation, the site being a portion of the muddy land reclaimed from the sea by the Harwich Improvement Quays and Pier Act. So successful, however, has been the result, that in no instance is there the slightest subsidence, not even with the chimney, which is seventy feet high. Many persons practically acquainted with such matters have visited the works, and expressed an opinion that for solidity of construction, excellence of arrangement, and general finish, the Harwich Gas Company may challenge comparison with any works of the size in the kingdom. The contractors are Messrs. Paddon and Ford, of London, for the iron work, apparatus, and mains; and Messrs. Wilding and Butcher, of Harwich, for the buildings; and both firms appear to have carried out the ideas of the engineer to the satisfaction of their employers and their own credit. It has been said up to this time that Harwich was the largest town in England without gas; but happily this reproach no longer exists, and with the other improvements effected or in contemplation, it is evident that she will soon take that rank amongst our mercantile towns to which her situation and great natural advantages entitle her.—*Essex Standard*, Feb. 2.

Fire at the London (Vauxhall) Gas Works.—Between one and two o'clock in the afternoon of Friday, the 12th ult., a destructive fire broke out at these works, which caused considerable alarm in the neighbourhood. It appears that one of the gas-holders had become so oxidized that an escape of gas took place at the rivets by which the crown is fixed to the angle iron curb, and a portion of the gas being carried into a neighbouring retort-house, where some retorts were being charged, it became ignited, and blazed up to such a height as to fire the wooden bridge that extended over the top of the gasometer. The men went to work in an admirable manner, but, unfortunately, while some of the hands were conveying a heavy ladder towards the gasometer, it fell violently against the chest of a man named Clarke, which broke his breastbone and otherwise severely injured him. Dr. Bishop was sent for by the company to attend upon the unfortunate man, but the medical gentleman could not hold out the least hopes of his recovery. The engines of the parish, Burnett's distillery, Price's candle works, Hodges's distillery, and two of the London Brigade from the Waterloo and Southwark bridge-road stations were soon in attendance, and, two engines having been set to work, the fire on the bridge was extinguished, but some hours elapsed before the fire under the gasometer could be subdued. An adjoining gasometer was in considerable danger, but fortunately escaped without being materially injured.

Presentation of Testimonial to Mr. Alfred Young.—This gentleman, who has for some years been the surveyor and chief inspector of the Equitable Gas Company, having been appointed to the deputy superintendentship of the Commercial Company, the inspectors and workmen of his late company, presented him, on Jan. 9, 1855, on his retirement, with a massive gold pencil-case, as a mark of their appreciation of those gentlemanly and kind feelings, that have ever characterised his behaviour towards them. Mr. Charles Tarvett, in the name of his brother inspectors and the workmen, presented the testimonial; and in language expressive of hope for the future well-doing of their late brother officer, begged him to believe that he left behind him remembrances of his kindness that time would not easily efface.

Yule and Wilkie's Gas Exhauster.—The exhauster of Messrs. Yule and Wilkie, now in use at the Paisley Gas Works, is a slight modification of their rotatory engine, and consists of a cylinder 21 inches diameter, and 21 inches long, with two flat ends bolted on. Inside the main cylinder is another 12 inches diameter, the axis of which is placed eccentrically to it, but in the centre of the main cylinder. This rolling

(*Continued on page* 41)

Share List.

(Directors and Managers of Gas Works are earnestly requested to enable us to rectify the errors and fill up any omissions in the following List.)

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£	**ENGLAND.**	£ s. d	£ s. d	£ s. d
		Aberdare			
		Abergele			
		Aberystwith			
		Abingdon			
1050	10	*Accrington*	10 0 0	7 0 0	15 10 0
		Albrighton			
		Alcester			
		Alford			
		Alfreton			
		Alnwick			
		Alston Moor			
250	10	Alton	10 0 0	5 0 0	10 0 0
800	5	Altrincham	5 0 0	6 0 0	6 0 0
		Amersham			
170	10	Ampthill	10 0 0	5 0 0	10 0 0
350	10	Andover	10 0 0	5 0 0	11 0 0
330	5	Appleby	5 0 0	3 0 0	2¼ to 2½
		Arundel			
		Ashbourn, Derby			
292	5	Ashburton	5 0 0	5 0 0	
		Ashby-de-la-Zouch			
		Ashford, Kent			
1600	30	*Ashton-under-Lyne*	30 0 0	10 0 0	60 0 0
		Atherstone			
		Axminster			
200	20	Aylesbury	20 0 0	5 0 0	21 0 0
		Aylsham, Norfolk			
		Bacup, Lancashire			
		Bakewell			
200	10	Baldock	10 0 0	5 0 0	10 0 0
1000	10	Banbury	10 0 0	5 0 0	10 10 0
		Bangor			
500	5	Barking, Essex	5 0 0	5 0 0	5 5 0
260	10	Barnard Castle	10 0 0	5 10 0	10 15 0
		Barnsley £6000		7 10 0	
100	20	Barnstaple	20 0 0	5 0 0	23 0 0
1158	2	Barton-on-Humber	2 0 0	5 0 0	2 0 0
120	25	Basingstoke	25 0 0	7 0 0	35 0 0
2500	20	*Bath*	16 0 0	10 0 0	30 to 32
		Battle £2000		6 0 0	
56	26½	Bawtry	26 10 0	5 0 0	25 0 0
		Beccles (& Water)			
300	30	Bedford	25 0 0	4 0 0	20 0 0
200	10	Bedworth	10 0 0	5 0 0	11 0 0
		Belford			
		Bedale, Yorkshire			
		Belper			
		Beminster			
420	5	Berkhempstead	5 0 0	6 0 0	6 0 0
700	10	Berwick-on-Tweed	10 0 0	6 0 0	12 0 0
		Bewdley			
280	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
170	10	Bicester	10 0 0	6 0 0	11 5 0
		Bilston £15,100	5 0 0	7 0 0	6 10 0
		Billericay			
		Bingham			
		Bingley £7400		4 0 0	
		Birkenhead £70,000	35 0 0	3 0 0	35 to 37
2400	50	*Birm. & Staffordsh.*	50 0 0	10 0 0	99½ to 100½
2400	25	*Ditto*, new shares	10 0 0	10 0 0	15 to 16
928	75	*Birmingham*	75 0 0	10 0 0	158 to 160
		do. 1-10 shares			15 to 16
		Bishop's Auckland			
140	25	Bishop's Stortford	25 0 0	5 0 0	24 0 0
3000	15	*Blackburn*	15 0 0	10 0 0	25 0 0
		Blandford			
		Blyth			
		Bodmin			
		Bognor			
3909	16½	*Bolton*	16 10 0	9 19 5	39 0 0
		Boroughbridge			
160	50	*Boston*	50 0 0	10 0 0	75 0 0
200	10	Bourn	10 0 0	5 0 0	10 0 0
160	10	Brackley	10 0 0		
		Bradford, Wilts			
	25	*Bradford, Yorksh.* £45,000	25 0 0	10 0 0	49 0 0
		Brampton, Cumblnd			
		Brandon, Suffolk			
		Brecon			
		Bridge-end, Glam.			
6000	5	*Brierly Hill*	5 0 0	4 0 0	5 2 6
		Brighouse			
2250	20	*Brighton*	20 0 0	5 0 0	15 to 16
1125	20	,, new shares	16 0 0	5 0 0	10 to 12
2471	20	*Brighton and Hove*	20 0 0	3 10 0	
107	8	,, new shares			
179800	Stk.	*Bristol United*	Stock	8 0 0	170 to 175
154	8	Brixham	8 0 0	5 0 0	5 to 6
		Braintree			
750	50	*Brentford*	50 0 0	5 10 0	48 to 50
800	25	,, new shares	11 0 0	5 10 0	11 0 0
		Brentwood			
200	30	*Bridgwater*	30 0 0	5 0 0	30 0 0
400	10	Bridlington	10 0 0	5 0 0	10 0 0
		Bridport			
		Brigg			
		Broadstairs			
		Bromsgrove			
		Bromley (Kent)			
		Broughton			
120	10	Bruton	10 0 0	4 0 0	8 0 0
		Brynmawr			
100	25	Buckingham	25 0 0	6 0 0	28 0 0
600	12	*Burnley*	12 0 0	10 0 0	
		Burslem & Tunstall			
		Burton-on-Trent			
		Bury, Lanc. £6570			
		Bury St. Edmund's		5 0 0	
200	10	Buxton	10 0 0		
		Callington			
		Calne, Wilts			
		Camborne			
	50	*Cambridge* £34,560	50 0 0	7 0 0	76 0 0
240	50	*Canterbury*	50 0 0	6 0 0	61 to 63
	25	*Canterbury*, 2d iss.	25 0 0	6 0 0	30 to 31
800	25	*Cardiff*	25 0 0	7 10 0	34 0 0
		Carmarthen			
		Castle Cary			
249	5	Castleford	5 0 0	5 0 0	5 0 0
300	5	Castletown (Man)	2 0 0		
		Chapel on the Frith			
		Chard			
		Chatteris			
255	10	Cheadle	10 0 0	5 0 0	10 0 0
200	50	Chelmsford	50 0 0	5 0 0	84 0 0
		Cheltenham £18,732		9 0 0	
		Chepstow			
230	10	Chesham, Bucks	10 0 0	5 0 0	10 0 0
		Chester			
250	5	Chester-le-Street	5 0 0	6 0 0	5 0 0
		Chesterfield £13,123		4 17 6	
240	25	Chichester	25 0 0	6 0 0	30 0 0
		Chippenham			
		Chipping Norton			
		Chorley			
		Christchurch			
		Cirencester			
		Clare (Suffolk)			
		Cleckheaton, York.			
		Clitheroe			
750	4	Cockermouth	4 0 0	7 0 0	5 0 0
		Colchester			
		Collumpton			
		Colne, Lancashire			
		Coleford, Gloucest.			
300	5	Coggeshall	5 0 0	3 0 0	3 0 0
200	25	*Congleton*	25 0 0	5 0 0	31 0 0
		Conway			
		Cowbridge			
		Corsham			
800	25	*Coventry*	25 0 0	6 0 0	30 0 0
		Cowes			
300	5	Crowland			
		Croydon ... £20,000		5 0 0	
		Cranbrook ... £1900		5 0 0	
		Crayford & Bexley			
420	5	Crediton	5 0 0	5 0 0	6 0 0
		Crewe, Cheshire			
		Dalton			
		Darlaston			
		Darlington & Water			
250	20	Dartford	20 0 0	7 10 0	27 0 0
125	20	Daventry	20 0 0	6 0 0	24 8 0
		Dawley, Salop			
346	5	Dawlish	5 0 0	8 0 0	7 10 0
		Deal			
		Dedington			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
820	10	*Deptford*	10 0 0		1 to 2
	25	*Derby*	25 0 0	10 0 0	50 0 0
90	20	Dereham (East)	20 0 0	5 0 0	21 0 0
4000	5	*Dewsbury*	5 0 0	7 0 0	8 12 6
		Devizes			
7000	5	*Devonport*	5 0 0	6 0 0	7 10 0
280	25	Dorchester	25 0 0	5 0 0	30 0 0
120	25	Dorking	24 0 0	5 0 0	25 0 0
192	25	Douglas, Isle of	25 0 0	8 0 0	30 0 0
209	56½	*Dover* ..... [Man	56 10 0	5 15 0	71 to 72
25	60	Downham	60 0 0	7 10 0	
		Driffield			
		Droitwich			
600	20	*Dudley*	20 0 0	5 0 0	28 to 30
		Droylsden			
		Dukinfield			
		Dunmow			
250	10	Dunstable	10 0 0	5 0 0	8 0 0
		Durham			
276	9	Dursley, Gloster	9 0 0	5 10 0	8 0 0
300	10	Eastbourne			
		East Grinstead			
		Egremont, Cumbld			
703	6½	Elland	6 10 0	8 0 0	10 0 0
		Ellesmere			
200	10	Emsworth			
400	5	Enfield	5 0 0	5 0 0	5 0 0
300	19	Epsom and Ewell	19 0 0		
		Eton (Cannel Gas)			
		Evesham			
1600	25	*Exeter*	25 0 0	8 0 0	40 to 42
		Exmouth			
		Eye, Suffolk			
150	10	Fairford	10 0 0		
64	25	Fakenham	25 0 0	5 0 0	25 0 0
		Falmouth			
100	30	Fareham	30 0 0	2 10 0	30 0 0
120	25	Farnham	25 0 0	10 0 0	42 0 0
		Farringdon			
		Faversham			
		Ferry Hill (Durhm.)			
	5	Filey	5 0 0	5 0 0	5 0 0
		Fleetwood			
300	10	Folkestone	10 0 0	10 0 0	15 0 0
240	10	,, new shares	8 0 0	10 0 0	13 0 0
		Fowey			
		Fordingbridge			
240	5	Framlingham	5 0 0	5 0 0	5 10 0
		Frome			
		Gillingham, Dorset			
		Glastonbury			
		Glossop ... £10,000		9 0 0	
1000	25	*Gloucester*	25 0 0	7 10 0	28 0 0
516	5	Gomersal	5 0 0		
		Godalming			
350	10	Gorleston & South-Gosport ..... [down	2 10 0		2 10 0
450	20	Grantham	20 0 0	7 0 0	28 0 0
1000	20	Gravesend	20 0 0	5 0 0	21 0 0
		Grays Thurrock			
1000	10	*Great Grimsby*	9 10 0	8 0 0	13 to 14
		Great Torrington			
	25	Guildford	25 0 0	4 0 0	20 0 0
12,000					
6000					
2000					
4000					
12,000					
15,000					
360	5	Halesworth	5 0 0	7 10 0	5 10 0
600	25	*Halifax*	25 0 0	10 0 0	48 0 0
		Halstead			
		Hampton Court			
1000	10	*Harrogate*	6 5 0	5 0 0	6 5 0
	5	*Hartlepool* £15,137	5 0 0	7 10 0	7 12 6
		Harwich			
540	6	Haslingden, Lansh	6 0 0	7 10 0	6 0 0
330	50	*Hastings and St. L.*	50 0 0	6 0 0	60 0 0
500	5	Havant			
		Haverhill			
		Haworth, Yorks.			
		Hayle			
4965	1	Hebden Bridge	12 6		15 0
		Helstone			
250	10	Hemel Hempstead	10 0 0	4 0 0	6 10 0
300	10	Henley-on-Thams.	10 0 0		
		Hereford £5300		4 0 0	
300	10	Herne Bay	10 0 0	6 0 0	11 0 0
270	10	Hexham	10 0 0	7 0 0	12 0 0
400	25	*Heywood*		7 10 0	
520	5	High Wycombe	5 0 0	6 0 0	6 16 0
		Highworth (Wilts)			
280	10	Hinckley	10 0 0	5 0 0	9 0 0
		Hindley, Lancash.			
200	20	Hitchen	20 0 0	5 0 0	20 0 0
100	10	Hythe & Sandgate	10 0 0	6 0 0	11 0 0
		Hoddesden			
		Holbeach			
		Holmfirth £8880		3 10 0	
		Holyhead			
		Holywell (see Brit.			
95	25	Honiton ... [Prov.)	25 0 0	4 0 0	17 0 0
		Horbury			
6	500	Horncastle	500		
1200	2½	Horsforth	2 10 0		2 10 0
128	20	Horsham	20 0 0	5 0 0	
	10	Houghton-le-Sprg.	10 0 0	8 0 0	
		Howden			
		Hull, Sculcoats (see Brit. Provincial)			
		Hull, £11,712. 10s.		5 0 0	
210	10	Hungerford	10 0 0	5 0 0	10 0 0
		Huddersfield			
		Hyde (Cheshire)			
		Idle and Eccleshill			
400	6½	Ilkeston	6 5 0	3 10 0	6 5 0
		Ilminster			
		Ilford			
		Ilfracombe			
		Ironbridge			
1400	10	*Ipswich*	10 0 0	8 0 0	15 0 0
1400	10	,, new shares	7 10 0	8 0 0	12 10 0
800	25	*Isle of Thanet*	20 0 0	5 0 0	20 to 21
		Kendal £9100		8 15 0	
300	10	Kenilworth	7 10 0		7 10 0
400	5	Keswick	5 0 0	4 5 0	4 4 0
100	25	Kettering	25 0 0	5 0 0	25 0 0
		Kiddermins. £10000		5 0 0	
		Kimbolton			
		King's Langley			
		Kingston-on-Thms			
		Kington, Hereford			
		Kirkby Lonsdale			
		Kirkham, Lanc.			
		Knighton			
		Knutsford			
		Lancaster			
		Llanelly £3000		5 0 0	
		Llandovery			
		Leamington Priors £22,500		6 0 0	
160	10	Leatherhead	10 0 0		
		Ledbury			
		Leeds Old Comp.			
	25	old stk., £60,300	25 0 0	10 0 0	46 to 47
	25	new ,, £23,775	25 0 0	6 0 0	29 to 30
	20	*Leeds New* £60,000	20 0 0	10 0 0	36 to 38
3623	10	*Leicester*	10 0 0	7 0 0	15¾ to 16¼
		Leigh (Lancashire)			
135	20	Leighton Buzzard	20 0 0	7 0 0	21 0 0
400	10	Leominster	9 0 0	5 0 0	8 0 0
		Leyburn, Yorksh.			
240	5	Liskeard	5 0 0	8 0 0	6 0 0
330	25	Lewes	25 0 0	5 0 0	25 0 0
320	25	*Lincoln*	25 0 0	10 0 0	48 0 0
		Leyland, Lancash.			
240	5	Littlehampton	5 0 0	7 10 0	5 0 0
250	20	Lichfield	20 0 0	10 0 0	35 0 0
		Liverpool United	100 0 0	10 0 0	182 to 186
		,, ¼ sh.	25 0 0	10 0 0	47¼ to 47¾
50	25	Langport	25 0 0	4 0 0	15 0 0
		London Comps.—			
5000	10	Anglo-Romano	10 0 0		4 0 0
5000	20	British Provincial (Holywell, Hull, Norwich, Potteries, Trowbridge)	20 0 0	7 0 0	20 to 21
	20	,, Prov., new	16 0 0	7 0 0	17 to 18
4000	25	*Commercial*	25 0 0	6 0 0	25 to 27
2000	25	,, new shares	2 10 0	6 0 0	par to 1pm
		,, deb. £12,000			
	50	*Chartered*	50 0 0	4 0 0	39½ to 40
	50	,, new shares	10 0 0	4 0 0	7¼ to 8
	150	*City of London*	150 0 0	3 0 0	95 to 100
	50	*Equitable*	50 0 0	4 0 0	29 to 30
		,, deb. £47,600			
	20	European— (Amiens, Boulogne, Caen, Havre, Nantes, & Rouen)	20 0 0	5 & bonus	14 to 15
	10	*Gt. Cntl. Consumers* deb. £66,000	10 0 0	8 0 0	10½ to 11

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
8000	50	*Impl. Continental* —First capital (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam)	42 0 0	6 11 0	40 to 45
7000	50	Second capital—(Aix la Chapelle, Antwerp, Bordeaux, Brussels, Cologne, Frankfort-on-Maine, Haarlem, Marseilles, Toulouse Vienna)	41 0 0	10 7 0	68 to 70
	50	Third capital	43 10 0	9 4 0	67 to 69
13,000	50	*Imperial*	50 0 0	9 0 0	97½ to 98
13,000	50	„ (new)	5 0 0	10 0 0	12 to 13
4000	40	*Independent*	40 0 0	6 0 0	48 to 50
5000	50	*London*	50 0 0		5 0 0
1000	50	„ (red)	50 0 0		
2000	50	„ (blue)	50 0 0	3 6 0	15 to 18
6000	25	„ (preference)	25 0 0	6 0 0	25 to 26
50,000	1	Oriental (Calcutta)	1 0 0		¾ to ¼
9000	50	*Phœnix*	49 0 0	4 0 0	28½ to 29½
1000	100	*Ratcliff*	90 0 0	5 0 0	70 to 72
4000	25	*South Metrop.*	25 0 0	5 0 0	22 to 24
7000	10	*Surrey Consumers'*	10 0 0	8 0 0	11 0 0
9000	50	United Genl. (Cork, Dublin, Limerick	50 0 0	2 0 0	19½ to 20
6110	20	Western A shares	20 0 0	2 0 0	13 to 14
3500	20	„ B „	11 0 0	2 0 0	3 0 0
		Littleborough			
		Lostwithiel			
		Loughborough			
240	25	*Louth*	25 0 0	6 0 0	26 10 0
2500	10	*Lowestoft (& Water)*			
		Llangollen			
611	5	Ludlow Union	5 0 0	5 0 0	5 0 0
		Luton			
		Lutterworth			
63	20	Lyme Regis	20 0 0	4 0 0	20 0 0
120	25	Lymington	25 0 0	5 0 0	25 0 0
200	10	Malmesbury	10 0 0	2 10 0	5 15 0
		Macclesfield 32,000£			
		Maidenhead			
300	50	*Maidstone*	50 0 0	10 0 0	90 0 0
160	40	Maldon	33 0 0	5 10 0	24 0 0
		Marlborough			
		Malton (New)			
		Manningtree			
		Mansfield £5000		10 0 0	
150	10	Mansfield Woodhouse	10 0 0		
		March			
		Margate (see I. of T.			
		Market Deeping			
		Market Drayton			
132	25	Market Harboro'	25 0 0	6 0 0	34 0 0
		Market Raisin			
		Market Weighton			
210	10	Marlow	10 0 0	5 0 0	10 0 0
370	10	Maryport	10 0 0	6 0 0	12 0 0
500	5	Matlock Baths	5 0 0		
		Melksham			
		Melton Mowbray			
		Merthyr Tydvil			
50	10	Mere	10 0 0		
		Middleton £9039		5 0 0	
		Midsummer Norton			
		Middlesboro'			
198	5	Mildenhall	5 0 0	5 0 0	5 0 0
700	10	Mitcham	10 0 0	10 0 0	14 10 0
650	5	Mold (and Water)	5 0 0	6 0 0	6 10 0
700	10	Monmouth	10 0 0	5 0 0	
		Monk Wearmouth			
150	10	Moreton in Marsh	10 0 0	3 10 0	
		Morley (nr. Leeds)			
		Mossley			
		Mottram			
220	16	Morpeth	16 0 0	5 0 0	17 10 0
		Nantwich			
		Neath			
183	10	Needham Market	10 0 0	4 0 0	
		Newark £5000		10 0 0	
250	20	Newbury [Union	20 0 0	5 0 0	20 0 0
13,000	5	Newcastle & Gateshd	5 0 0	8 0 0	7 12 6
		Do. un. Lyne £6200		4 0 0	
600	5	Newmarket	5 0 0	6 0 0	5 0 0
250	5	Newent	5 0 0		
		Newhaven (Sussex)			
		New Mills £2115			
		Newport, M. £11720		8 0 0	
320	50	*Newport, Isle of W.*	38 0 0		5 0 0
		Newport Pagnell			
		Newport, Salop			
		New Romney			
		Newton Abbot			
		Newton, Lanc.			
		Newtown (Mntgom.			
		Northallerton			
120	10¼	North Walsham	10 10 0	5 0 0	10 10 0
542	20	*Northampton*	18 0 0	10 0 0	31 0 0
		Northwich			
		Norwich (see British Pro. £40,000		7 0 0	
900	50	*Nottingham*	50 0 0	10 0 0	
900	50	New shares		10 0 0	
		Nuneaton			
170	10	Oakham	10 0 0	4 10 0	8 10 0
		Oakhampton			
200	10	Odiham, Hants	10 0 0	4 0 0	10 0 0
		Olney			
100	10	Ongar	10 0 0	2 10 0	5 0 0
658	10	*Ormskirk*	7 10 0	5 0 0	
		Otley, Yorkshire			
80	25	Oundle	25 0 0	7 0 0	25 0 0
120	150	*Oxford*	150 0 0	6 10 0	230 0 0
		Over Darwen £8000		5 0 0	
		Padiham			
		Padstow			
		Pately Bridge, Yrk.			
		Peeltown (Man)			
		Pembroke			
250	20	Penrith	15 0 0	6 10 0	21 0 0
		Penryn			
		Penzance			
200	10	Petworth	10 0 0	9 10 0	14 15 0
330	5	Petersfield	5 0 0	4 0 0	5 0 0
		Pickering			
3000	10	*Plymouth*	10 0 0	8 0 0	18 0 0
		Pocklington			
		Pontefract			
		Pontypridd		4 0 0	
400	10	Poole	10 0 0	5 0 0	10 0 0
		Port Madoc			
600	50	*Portsea Island*	53 0 0	5 0 0	59 to 51
		Potton (Beds)			
400	10	Prescott	9 0 0	4 13 4	7 0 0
3000	20	*Preston*	20 0 0	10 0 0	44 0 0
		Pudsey £12,000		5 0 0	
		Pwlheli			
		Quordon & Montarl			
		Radcliff and Pilkington £9000		4 12 10	
		Ramsay, I. of Man			
		Ramsgate (see I. of T			
1000	10	*Reading*	10 0 0	4 0 0	7¼ to 8
500	20	*Reading Union*	20 0 0	4 0 0	16 0 0
		Redditch			
		Redruth			
		Reigate			
		Retford (East)			
		Rhyl			
		Richmond (Surrey)			
400	5	Rickmansworth	5 0 0		5 0 0
180	10	Ringwood	10 0 0		10 0 0
		Ripon			
		Roches. & Chatham		6 0 0	
		Rochford [£20,000			
		Rockingham			
		Romford			
		Ross			
245	25	*Rotherham*	25 0 0	6 0 0	38 to 39
	12½	do. Half Shares	12 10 0	6 0 0	19 to 19½
		Royston			
		Rugby			
500	10	Rugeley	8 10 0	5 0 0	10 10 0
		Runcorn £11,000		7 10 0	
		Ruthin			
500	10	Ryde	10 0 0	6 0 0	12 0 0
		Romsey			
		Saddleworth			
225	20	Saffron Walden	20 0 0	3 15 0	19 0 0
		St. Alban's			
		St. Austel			
		St. Asaph			
		St. Colomb			
		St. Helen's £7500		7 10 0	
		St. Helier's (Jersey)			
		St. Ives, Hunting.			
		St. Ives, Cornwall			
250	10	St. Neot's	10 0 0	8 0 0	12 0 0
		St. Peter's Pt., Guer			
	25	Salisbury [nsey	25 0 0	6 0 0	28 to 30
317	10	Sandbach	10 0 0	5 0 0	12 0 0
140	10	Saxmundham	10 0 0	5 0 0	10 0 0
		Scarborough	10 0 0		13 0 0
201	5	Sedburgh	5 0 0	2 10 0	4 15 0
300	16	Selby	16 0 0	5 0 0	16 0 0
		Settle			
290	10	Sevenoaks	10 0 0	4 0 0	10 0 0
250	10	Shaftesbury	10 0 0	3 0 0	9 0 0
5400	25	*Sheffield United*	24 0 0	7 10 0	29 to 30
		Shelton, Pott. (s. B. P			
		Shepton Mallet			
600	5	Sherborne	5 0 0	5 0 0	5 0 0
2914	5	Shields (Tynemth.	5 0 0	5 0 0	5 17 6
		Shields (South)			
		Shiffnal, Salop			
1000	5	*Shipley*	5 0 0	6 0 0	7 10 0
150	10	Shipston-on-Stour	10 0 0	5 0 0	10 0 0
		Shoreham			
		Shrewsbury £10,000		7 0 0	
400	10	Skipton	10 0 0	4 0 0	11 0 0
		Sleaford			
250	10	Slough	10 0 0		
		Snaith			
		Soham			
400	5	Southam	5 0 0		
		Southend, Essex			
300	5	Southwold [Bdge)	5 0 0	5 0 0	5 0 0
2000	5	South Essex (Lea			
		South Molton			
1000	50	*Southampton*	32 0 0	5 0 0	
220	10	Southwell	10 0 0	4 0 0	
		Sowerby, Yorksh.			
		Spennymoor (Dur.)			
		Spittal (Berwick-			
400	5	Spilsby [on Tweed)	5 0 0		
		Staindrop			
		Stretford			
		Stokesly			
		Stafford £10,000		5 0 0	
		Staines and Egham			
		Staley Bdg. £15,000		10 0 0	
	50	*Stamford*	50 0 0	4 0 0	48 0 0
	9½	*Stockton-on-Tees*	9 10 0	9 0 0	11 to 12
1000	10	Stoke-upon-Trent	10 0 0	7 0 0	12 15 0
500	10	„ new shares	8 0 0	7 0 0	10 10 0
		Stone, Stafford			
		Stoney Stratford			
		Stourbridge			
		Stowmarket			
150	20	Stratford-on-Avon	20 0 0	7 10 0	30 0 0
		Stroud			
169	10	Swaffham	10 0 0	5 0 0	5 10 0
		Swansea £9000			
		Sudbury			
		Sunderland, old			
6400	5	*Sunderland*, new	5 0 0	6 0 0	6 12 6
200	10	Sutton Coldfield	10 0 0		
		Sutton (Surrey)			
250	10	Sutton-in-Ashfield	10 0 0	5 0 0	10 0 0
		Sutton Southcoates & Drypool (Hull)	20 0 0		23 to 24
		Swindon			
1000	10	Sydenham	10 0 0		
2800	5	*Taunton*	5 0 0	6 0 0	6 0 0
		Tadcaster			
		Tamworth			
		Tavistock			
200	5	Tenbury	5 0 0	5 0 0	5 0 0
		Tenby			
150	10	Tenterden	10 0 0	4 0 0	8 0 0
		Tetbury, Gloster			
		Tewkesbury			
200	10	Thame	10 0 0	5 0 0	10 0 0
230	10	Thetford	10 0 0	6 0 0	10 10 0
		Thirsk			
		Thornbury			
		Thorne			
111	10	Tiverton	10 0 0	10 0 0	17 to 18
1141	5	Todmorden	5 0 0	5 0 0	6 0 0
600	2½	Topsham	2 10 0		3 0 0
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes Consumers			
4000	5	Tottenham	3 15 0	8 0 0	4 0 0
		Towcester			
		Town-Malling			
225	10	Tring	10 0 0	5 0 0	10 0 0
		Trowbridge (see			
75	50	Truro [Brit. P.)	50 0 0	5 0 0	
		Tunbridge			
		Tunbridge Wells			
		Tuxford			
		Ulverston			
		Uppingham			
240	5	Upton-on-Severn	5 0 0	5 0 0	5 0 0
		Usk			
		Uttoxeter			
		Uxbridge			
		Ventnor			
1000	25	*Wakefield*, old capl	25 0 0	8 0 0	35 0 0
1600	5	„ new „	5 0 0	8 0 0	7 0 0
		Wallasey			
300	10	Wallingford	10 0 0	5 0 0	0 0 0
994	10	Wandsworth	10 0 0	5 0 0	0 0 0
200	10	Wantage	9 0 0	5 0 0	10 10 0
	20	*Warrington* £23304	20 0 0	10 0 0	28 to 29
100	10	Wareham	10 0 0	3 10 0	8 0 0
		Warkworth			
120	25	Warminster	25 0 0	0 0 0	27 0 0
		Warth			
		Warwick £15,000		0 0	
		Watford			
111	25	Welchpool, Mntgy.	25 0 0	5 0 0	25 0 0
		Wellingborough			
100	21	Wellington, Salop	24 0 0	7 10 0	24 0 0
		Wellington, Somers			
160	25	*Wells, Smrst.* £5000	25 0 0	10 0 0	32 to 34
		Westbury			
		Weston-sup.-Mare			
2600	5	West Ham	5 0 0	5 0 0	5 0 0
		Wetherby			
		Whitby			
		Whitehaven			
		Whitstable			
250	10	Whittlesea	10 0 0	5 0 0	11 0 0
1216	10	*Wigan*	10 0 0	10 0 0	22 0 0
		Willenhall			
		Wilton			
141	10	Winslow	10 0 0	5 0 0	10 0 0
240	10	Wimborne Minster	10 0 0		
600	10	Wimbledon	8 0 0		8 0 0
		Wincanton			
380	50	Winchester	50 0 0	5 0 0	50 0 0
900	12½	Windsor	12 10 0	10 0 0	23 0 0
		Witham			
		Witney			
4480	10	*Wolverhampton*	10 0 0	9 0 0	19 to 19½
4480	10	do. new shares	1 5 0	9 0 0	4 5 0
		do. deb. £10,000			
200	10	Woburn	10 0 0	5 0 0	10 0 0
210	10	Wokingham	10 0 0	4 0 0	10 0 0
12	500	Woodbridge	500 0 0	5 0 0	
600	2½	Woodstock	2 10 0		2 15 0
		Wooler			
		Wotton-un.-Edge			
2900	10	*Worcester*	10 0 0	8 0 0	14 5 0
		Workington			
		Worksop & Radford			
200	10	Wirksworth	10 0 0	5 0 0	10 0 0
		Worthing			
		Wrexham			
1800	10	Woolwich Equitbl.	10 0 0	5 0 0	10 2 6
		Woolwich Consms.			
		Woolwich (North)			
		Wymondham			
795	20	Yarmouth	20 0 0	5 0 0	17 to 18
		Yeadon, near Leeds			
140	30	Yeovil	30 0 0	5 0 0	30 0 0
	5	*York Untd.* £55,000	5 0 0	6 0 0	7 10 0

SCOTLAND.

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
13,000	5	Aberdeen	3 11 0	7 0 0	4 10 0
420	10	Airdrie	10 0 0	7 10 0	12 10 0
		Alloa			
		Annan			
1300	1	Anstruther	1 0 0	7 10 0	1 2 6
100	20	Ardrossan	20 0 0	4 0 0	20 0 0
550	20	Arbroath	20 0 0	7 10 0	30 0 0
381	5	Auchterarder	5 0 0	7 10 0	7 0 0
750	2	Auchtermuchty	2 0 0	6 0 0	2 10 0
2666	5	Ayr, old	5 0 0	6 0 0	6 0 0
2500	2	Ditto, new	2 0 0	6 0 0	2 0 0
250	10	Banff	10 0 0	9 10 0	10 12 6
		Barrhead			
		Bathgate			
		Beith			
1000	1	Bervie	1 0 0		1 0 0
		Biggar			
739	5	Blairgowrie	5 0 0	8 0 0	7 0 0
400	6	Borrowstowness	6 0 0	5 0 0	8 0 0
540	5	Brechin	5 0 0	8 10 0	9 0 0
		Bridge of Allan			
2250	2	Broughty Ferry	2 0 0	6 0 0	2 2 0
		Burntisland			
		Campbelton			

Number of Shares issued.	Amount per Share £	Name of Company.	Amount paid up per Share £ s. d	Dividend per Cent. per Ann. £ s. d	Price. £ s. d
		Carluke (Lanark)..			
		Clackmannan			
1333	3	Coatbridge	3 0 0	10 0 0	4 0 0
		Coldstream			
		Collinsburgh			
		Comrie			
2744	1	Crieff	1 0 0		1 0 0
		Crail, Fife			
600	1	Cullen	1 0 0	5 0 0	15 0
		Cumbernauld			
200	6	Cumnock	6 0 0	5 0 0	6 0 0
600	5	Cupar Angus	5 0 0	7 0 0	7 3 0
250	10	Cupar Fife	10 0 0	7 10 0	15 0 0
		Dalkeith			
750	2	Denny			
		Dingwall			
		Dornoch			
500	1	Douglas	1 0 0	6 0 0	1 1 0
		Dufftown			
		Dumbarton			
400	70	Dumfries	70 0 0	5 0 0	70 0 0
		Dunbar			
560	2½	Dunblane	2 10 0	4 0 0	2 10 0
	23½	*Dundee*, old £29,687	23 15 0	8 8 0	30 10 0
8000	5	*Dundee, new*	5 0 0	4 6 0	4 15 0
860	10	Dunfermline	10 0 0	7 10 0	15 0 0
		Dunkeld			
1000	2	Dunoon	2 0 0		2 0 0
		Dunse			
250	5	Dysart	5 0 0	7 10 0	6 0 0
6000	25	*Edinburgh Gas Co.*	25 0 0	10 0 0	56½ to 57
5480	25	„ *and Leith Co.*	25 0 0	10 0 0	53 0 0
		Elie			
455	11¼	Elgin	11 10 0	6 0 0	11 10 0
		Falkirk, old			
		„ new			
		Falkland			
		Ferry Port on Craig			
600	1	Fochabers	1 0 0		1 0 0
1440	5	Forfar	5 0 0	7 10 0	7 19 0
		Fort William			
2000	16s.	Fraserburgh	16 0	5 0 0	16 0
500	5	Galashiels	5 0 0	10 0 0	9 10 0
		Garlieston			
		Gatehouse n. Fleet			
900	2½	Girvan	2 10 0	6 0 0	2 10 0
6000	25	*Glasgow*	25 0 0	10 0 0	54 0 0
15000	10	*Glasg. City & Suburb.*	10 0 0	10 0 0	19 10 0
		Grangemouth			
		Grahamston			
	8½	Haddington	8 10 0	7 10 0	12 10 0
1600	5	*Hamilton*	5 0 0	10 0 0	8 3 0
440	5	Hawick	5 0 0	7 10 0	7 10 0
300	5	Helensburgh	5 0 0	7 10 0	7 10 0
1312	1	Huntly	1 0 0	7 10 0	1 1 0
250	5	Inverary	5 0 0	10 0 0	6 12 6
425	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Invern. Gas & Water*	10 0 0	7 0 0	14 0 0
2400	5	„ new shares	1 5 0	7 0 0	2 0 0
310	10	Irvine	10 0 0	10 0 0	15 0 0
		Jedburgh			
		Johnstone (Paisley)			
		Keith			
		Kelso			
		Kilmarnock			
	5	Kincardine	5 0 0	2 10 0	4 5 6
		Kinghorn			
		Kingskettle, Fife			
		Kinross			
	5	Kirkaldy	5 0 0	10 0 0	8 10 0
	5	Kirkcudbright	5 0 0	5 0 0	5 0 0
	3	Kirkintulloch, near	3 0 0	5 0 0	3 0 0
	5	Kirkwall... [Glasg.	5 0 0	5 0 0	4 10 0
	5	Kirriemuir	5 0 0	6 0 0	
		Lanark			
		Largo, near Leven			
	5	Largs	5 0 0	7 10 0	7 to 8
		Lasswade, n. Edin.			
	5	Lauder	5 0 0	5 0 0	5 0 0
		Leith			
	1	Leslie, Fife	1 0 0	7 10 0	1 8 0
	1	Lesmahago	1 0 0	6 0 0	1 0 0
	1	Leven	1 0 0	5 0 0	1 2 0
	10	Linlithgow	10 0 0	7 10 0	15 0 0
		Linton, n. Nobleh.			
		Lochee, n. Dundee			
	5	Lochgilphead	5 0 0	7 10 0	5 5 0
		Lochwinnock, near			
	1	Markinch. [Paisley	1 0 0	7 10 0	1 5 0
	3	Mauchline [Dumf.	3 0 0	5 0 0	3 0 0
		Maxwell-town, n.			
	5	Maybole, Ayrshire	5 0 0	4 10 0	5 0 0
		Maryhill, n. Glasg.			
	2	Melrose	2 0 0	7 10 0	2 0 0
	2	Mid & East Calder	2 0 0		2 0 0
	5	Moffat	5 0 0	5 0 0	5 0 0
	20	Montrose	20 0 0	10 0 0	35 0 0
		Musselburgh			
	1	Nairn	1 0 0	5 0 0	1 0 0
		Neilston, n. Glasg.			
	1	Newmills, near Kilmarnock	1 0 0	5 0 0	1 0 0
		Newburgh, Fife			
		Newton-on-Ayre			
	11½	Newton Stewart	14 10 0	5 0 0	14 10 0
		North Berwick, N B			
		North Queensferry			
	5	Oban	5 0 0	7 10 0	5 0 0
	5	Peebles	5 0 0	5 0 0	5 0 0
	25	Perth	25 0 0	4 16 0	22 10 0
	5	„ new	5 0 0	2 10 0	4 2 6
		Peterhead			
		Pittenweem			
	1	Pollokshaws, n Glsg	1 0 0	7 10 0	1 5 0
		Port Glasgow			
		Portobello, n. Edin.			
	5	Prestonpans	5 0 0	6 0 0	5 0 0
	1½	Rutherglen, n Glasg	1 6 8	5 0 0	1 6 8
		Renfrew, n. Paisley			
		Saltcoats			
	1	Sanquhar	1 0 0	5 0 0	1 0 0
		Selkirk			
		South Queensferry			
	12	St. Andrew's	12 0 0	6 0 0	14 0 0
	8	Stewarton	8 0 0	5 0 0	8 0 0
7330	2	Stirling	2 0 0	8 0 0	3 0 0
2500	1	Stonehaven	1 0 0	6 5 0	1 6 0
		Stonhouse, Lanrks.			
600	2½	Stornoway	2 10 0		2 15 0
420	5	Stranraer	5 0 0	7 10 0	5 to 5½
601	2	Strathaven, near	2 0 0	8 0 0	2 15 0
643	2½	Thurso... [Hamltn	2 10 0	4 0 0	2 10 0
		Tillicoultry, n. Alloa			
800	1	Tranent	1 0 0	5 0 0	1 0 0
		Troon			
		Wick			
		Wigton..... [haven			
2051	1	Wemyss and Buck-	1 0 0	6 0 0	1 2 0
		IRELAND.			
		Ardee			
300	10	Armagh	10 0 0	10 0 0	20 0 0
		Ballinasloe			
		Bangor (co. Down)			
700	80	*Belfast*	80 0 0	7 10 0	80 0 0
51	5	Ballymena	5 0 0	10 0 0	
		Ballymoney			
150	5	Ballynahinch	5 0 0		5 0 0
		Castlebaney			
		Carrickfergus			
1100	5	Carlow	5 0 0		4 10 0
400	5	Cavan	5 0 0		5 0 0
		Cork (see Un. Gen.)			
		Cookstown			
1300	5	Clonmel Consumrs	5 0 0	5 0 0	5 0 0
		Drogheda			
19,000	10	*Dublin Consumers*	6 0 0	7 0 0	8 10 0
		Dublin Hibernian			
160	25	Dundalk [(see U.G.	25 0 0	5 0 0	25 0 0
200	10	Dungannon	10 0 0	7 10 0	12 10 0
871	5	*Downpatrick*	5 0 0	4 0 0	5 0 0
		Enniskillen			
		Enniscorthy			
240	25	Galway	25 0 0	10 0 0	37 10 0
		Keady			
400	10	Kilkenny	10 0 0	8 0 0	11 5 0
		Killarney			
		Larne			
		Limerick (see U.G.)			
1725	5	Limerick Consum.	5 0 0		
		Lismore			
600	15	Londonderry	15 0 0	6 13 4	21 10 0
		Louth			
500	7	Lisburn	7 0 0	7 10 0	8 5 0
520	10	Lurgan	6 0 0	6 0 0	6 0 0
		Mallow			
		Monaghan			
		Nenagh			
448	5	Newtownards	5 0 0	6 0 0	6 15 0
		Newtownlimavady			
750	20	Newry	20 0 0	5 0 0	20 0 0
425	5	Omagh	5 0 0	10 0 0	6 0 0
125	20	Portadown	20 0 0	5 0 0	20 0 0
		Portaferry			
600	10	Sligo	10 0 0	2 10 0	7 0 0
		Tralee			
		Waterford			

The Gas Works in the undermentioned towns belong to private individuals:—

Abergavenny.	Chester (Roodee).	Fermoy.	Huntingdon.	Oswestry.	Sheerness.	Ware. (2 works)
Barnet.	Chertsey.	Gainsborough.	Hyde (Cheshire).	Parsonstown.	Sidmouth.	Wem.
Blaydon, n. Newcastle.	Crewkerne.	Goole.	Leiston (Suffolk).	Peterborough.	Sittingbourne.	Wexford.
Bridgenorth.	Dartmouth.	Harleston.	Lynn.	Pontypool.	Spalding.	Weymouth.
Brompton & Gillingham	Eltham.	Hertford.	New Ross.	Rye.	Tipperary.	Whitchurch (Salop).
Bungay.	Ely.	Holt.	Northfleet.	Sandwich.	Waltham Abbey.	Wisbeach.
Carnarvon.	Farsley.	Hunmanby.	Newport I. W. (new).	Seaham Harbour.		

The Gas Works belong to the Corporations, or to Commissioners acting under special acts of Parliament, in the following towns:—

Athlone	Coleraine.	Keighly.	Manchester.	Richmond (Yorkshire).	Southport	Trim (Meath).
Beverley.	Doncaster.	Kells (Meath)	Milton (Kent).	Rochdale.	Stockport	Walsall.
Blackpool.	Great Malvern.	Knaresborough.	Oldham.	Rothesay.	Strabane.	Wells (Norfolk).
Carlisle.	Greenock.	Leek.	Paisley.	Salford.	Teignmouth.	Youghall.
Cashel.	Haverfordwest.	Lytham (Lanc.)				

Price Current.

CASTINGS, per Ton.

Average Weight of Cast Iron Gas Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London. £ s. d.	Glasgow £ s. d.	Newcastle. £ s. d.	Wales. £ s. d.	Yorksh., Derbysh., and Staffdsh. £ s. d.
Pig Iron, No. 1	4 5 0	3 10 0	4 5 0	4 10 0	4 15 0
1¼ and 2 inches Socket Pipes	8 5 0	7 10 0	8 0 0	8 5 0	8 5 0
2½ and 3 do. do.	8 0 0	7 5 0	7 15 6	8 0 0	8 0 0
4 and 5 do. do.	7 15 0	7 0 0	7 10 0	7 15 0	7 15 0
6 inches and upwards do.	7 10 0	6 15 0	7 5 0	7 7 0	7 10 0
Retorts, 2nd fusion, hot blast	7 5 0	6 10 0	7 2 6	7 7 6	7 7 6
Do. 2nd fusion, cold blast	7 10 0	..	7 12 6	7 17 6	7 17 6
Tank Plates, ⅜ thick and above	8 0 0	6 15 0	7 7 6	7 12 6	7 12 6

COALS.

NEWCASTLE.	s.	d.		SCOTCH CANNEL.			
Unscreened.	7	6	per ton.	Boghead ..... at Leith	27	0	,,
Whitwell Primrose				Kirkness ..... best	23	0	,,
Pelton	8	0	,,	Capeldrae, first quality	20	0	,,
Medomsley				Ditto, second quality	12	6	,,
Pelaw	8	3	,,	Lesmahago at Glasgow	23	0	,,
Burnhope				Ditto at Grangemouth	25	0	,,
Eighton Moor				Arniston	22	0	,,
New Pelton	8	6	,,	Wemyss ... (at the pits)	16	0	,,
Pearath				Bridgeness	17	0	,,
South Pelaw				Kinneil			
Washington Hutton				Knightswood	18	0	,,
South Peareth				Lochgelly	12	6	,,
Ramsay's Cannel	18	0	,,	Lumphinan			
Cowen's Cannel	18	0	,,	Methill	11	0	,,

FIRE GOODS.	LEAD.
Best Bricks, 60s. per 1000, at Newcastle.	Soft pig, £23 to £24 per ton.
Do. Clay, 14s. per ton do.	

WROUGHT IRON TUBING, subject to 25 per cent. Discount.

	2 inches. s. d.	1½ inch. s. d.	1¼ inch. s. d.	1 inch. s. d.	¾ inch. s. d.	½ inch. s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ..... „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Flanches	1 9	1 6	1 3	1 0	0 9	
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	
Ditto 1 quart	11 6	10 6	10 3	10 0	9 6	

FREIGHTS, per Ton.

Coastwise—Newcastle.	8s. 9d	*Foreign.*	10s. 9d
Chatham & Roches.		Boulogne	
Cork	13 9	Barcelona	33 0
Dover	8 9	Bordeaux	22 0
Dublin	13 9	Cadiz	16 0
Exeter Quay	12 0	Calais	10 9
Folkestone	9 3	Constantinople	47 0
Hastings	10 9	Dieppe	12 6
Jersey	13 0	Genoa	35 6
London	9 6	Hamburg	13 0
Lowestoft & Yarmth	7 0	Havanna	14 0
Lynn	8 0	Havre	12 6
Margate	10 0	Leghorn	35 0
Portsmouth	11 0	Lisbon	16 6
Plymouth	11 9	Rotterdam	13 0
Whitstable	9 6	Stettin	12 0
Weymouth	10 6	Trieste and Venice	40 0

cylinder is keyed on the shaft, and is of course carried round with it, and in contact with the inner side of the main cylinder. Working through a stuffed slit on the upper side of the main cylinder is a flat oblong metal slide, which is moved up and down about 8 inches by a crank over it. This crank is made to synchronise in its rotation with the eccentric cylinder, by means of another shaft, connected with the main one by spur wheels. This sliding-plate is always kept in contact with the circumference of the eccentric cylinder, which it follows as it describes its rotation, so as to cut off all connection between the two sides of the main cylinder, which is thus formed into two chambers. The gas is conveyed by a large pipe into, say the left chamber. The eccentric cylinder revolves, and sweeps, as it were, the gas before it through another pipe communicating with the washers and purifiers, leaving a vacuum behind towards the retorts. In fact, the exhauster acts simply as a rotatory pump, instead of a rectilineal one of the usual construction. The advantage of this form of pump is that there are no valves, and that it can be driven as high as 200 revolutions a minute by a small steam-engine which is connected to the exhauster by a belt. When we saw it at work it was only necessary to keep up the speed to about 70 revolutions, at which rate it was capable of reducing the pressure into the retorts to zero. At a greater speed it would have formed a vacuum more or less intense. Such, however, is not desirable, and with a pressure of even one or two inches of water in the retorts no practical difficulty is experienced. The exhauster is an ingenious, simple, and effective piece of mechanism; and the commissioners of the gas company have expressed themselves as being highly gratified with the result. The only suggestion we can make is, that so important a machine, and which produces such valuable results, should be in duplicate, in case of anything going wrong with one.—*Glasgow Advertiser.*

Advertisements.

F. & C. OSLER,

44, OXFORD-STREET, LONDON;

Manufactory—Broad-street, Birmingham,

MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.

ELEGANT CRYSTAL GLASS CHANDELIERS, FOR GAS

(Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of Gas in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

WEST and GREGSON,

GAS METER MANUFACTURERS,

BRASSFOUNDERS, &c., UNION-STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

TO GAS COMPANIES, FITTERS, AND IRONMONGERS.

LLOYD and SUMMERFIELD,

Manufacturers of CUT and FLINT GLASS Jet Moons, Globes, Hemispheres, and Chimneys of every description; Hall Lamps, Lustres, and Chandeliers of the most modern patterns.

PARK GLASS WORKS, BIRMINGHAM.

TO GAS COMPANIES.

THE Proprietor of Carnaby's Patent

GAS REGULATOR is open to treat with Companies for Licenses to manufacture and sell these machines in their respective districts. The Regulator in question is the only one of the kind in use. It is entirely different from gas governors, as it brings the main-tap completely under the control of the master, enabling him to turn it on and off, and regulate the admission of gas, from his parlour or any part of the house—hence all chance of danger from the neglect of servants is removed. The machines are highly approved of by the persons using them, references to whom, and all further particulars, may be obtained on application to J. CARNABY, No. 130, ST. JOHN-STREET, Smithfield, LONDON.

IMPROVED

SELF-LUBRICATING GAS VALVES,

Used in nearly one hundred gas works in Great Britain and the Continent, and are esteemed for their strength, superior workmanship, non-liability to damage, never sticking, oiling themselves, always working free in tar, lime, or gas, never falling down, and their very legible index of opening of valve—advantages only possessed by these valves.

SELF-REGISTERING GAUGE COLUMN

To regulate the pressure in the Street Mains, showing at one glance the valve on the facing, area of the opening, size of pipe the gas passing will fill, and the pressure on the works and on the mains. This supersedes the necessity of the expense of a governor for small works, and should be placed on the by-pass, where a governor is used in large works. IT IS NEXT TO IMPOSSIBLE FOR THE VALVE MAN TO PUT A TOWN IN DARKNESS WITH THIS APPARATUS, and is a great ornament to the Valve-room.

IMPROVED ANNULAR CONDENSER.

Ensures perfect condensation with smallest weight of iron, and standing on the smallest space, the whole of the parts being instantly accessible. They are in use in various Gas Works, small and large, and passing 20,000 to 600,000 cubic feet per 24 hours.

DRY LIME AND OXIDE OF IRON PURIFIERS.

Perfect simplicity of action and improved Sieves, which are strong and very lasting, and the wires, when worn out, may be replaced in an hour and a half by any handy man in a gas work. The undersigned have made them, and have patterns for every size from 3 feet to 18 feet square.

GASHOLDERS, SCRUBBERS, &c.

CHARLES WALKER AND SONS,

LITTLE SUTTON-STREET, LONDON, AND MIDLAND IRON WORKS, TIPTON, STAFFORDSHIRE.

Applications for Prices, &c., to be addressed to their London Office, as above.

WOLVERHAMPTON PATENT TUBE WORKS.

WHITEHOUSE AND DIXON.

C. WHITEHOUSE, the original inventor of the WROUGHT-IRON GAS TUBES in 1824, having unremittingly given his attention to the most perfect means of manufacturing this much-required article for a period of more than thirty years, begs, with the utmost confidence, to solicit the commands of consumers generally, and especially engineers of water works under the General Board of Health, for GALVANISED WROUGHT-IRON TUBES, for water purposes, large quantities of which have been supplied to the Local Boards. Orders of any magnitude executed immediately, large stocks being always on hand, with requisite connections for Gas or Water. LAP-WELDED FLUES, for Locomotive and Marine Boilers, made of the best charcoal iron, and on the most approved method, of any diameter. Tubes for any purposes, and Brass Work of all kinds for Plumbers and Gasfitters, kept in stock for immediate requirement. Every article most carefully tested by machinery before leaving the works.

SHEARS AND SONS'

PATENT DRY GAS METERS

Are supplied to Gas Companies and the Public as the best and simplest Dry Gas Meters in use. They are acknowledged to be of first-rate workmanship and accuracy of registration.—Shears and Sons continue to supply these Meters on the most favourable terms; and they also manufacture Wet Gas Meters, to which they apply their Patent Indices.

BANKSIDE, LONDON.

H. JONES, Gas Meter Manufacturer,

No. 41, OLD-STREET, St. Luke's, London, begs respectfully to call the attention of Gas Companies to his latest improvements in the WET METER, by means of which water cannot be abstracted, neither can Gas by any possibility pass through the Meter without registering.

NOW READY.

VOL. III. of the JOURNAL of GAS-

LIGHTING, price 32s. 6d., bound in cloth and lettered. Cloth cases for binding may be had at 2s. 6d. each. G. HEBERT, 88, Cheapside.

M. KELLY, Cast Iron Wharf, 31,

Bankside, London.—Retorts of superior quality, Socket and Flange Pipes, Bends, Branches, Syphons, and every description of Castings for Gas and Water Works, Gasometers, Tanks, Purifiers, Condensers, &c., erected complete, or the materials supplied.

Gas Valves and Sluice Cocks on an improved principle. Patent Gas Tubing and Connections.

A stock of the above articles kept.

The Pipes and Retorts supplied by M. K. are cast vertically, which ensures soundness and equality of thickness throughout.

GREAT EXHIBITION PRIZE MEDAL, AND CERTIFICATE FOR GAS METERS, CLASS XXII., No. 424.

PADDON AND FORD,

GRAY'S-INN-ROAD, LONDON,

Patentees and Manufacturers of Wet and Dry Gas Meters, Station Meters, Governors, all kinds of Experimental Apparatus, Cooking and Heating Gas Stoves, iron barrel and Fittings, Main Cocks, &c. &c.

PADDON and FORD beg to thank their friends for the extensive patronage they have lately received, and to inform them that they have made such additions to their Manufactory as will for the future enable them to guarantee the greatest promptitude.

CARTER'S PATENT SAFETY GAS VALVES.

THOMAS LAMBERT and SON,

PATENTEES AND MANUFACTURERS,

SHORT STREET, NEW CUT, BLACKFRIARS, LONDON.

The Bank of England is fitted entirely with these Valves, from the smallest branch to the largest main pipe.

The following, among numerous testimonials, will be found very satisfactory:—

"The British Gaslight Company's Office, No. 105, Broad-street, Ratcliff, London, June 10, 1846.

"Gentlemen,—In reply to your inquiry, I have to state that 'Carter's Patent Gas Valve' has been used by this company and by the fitters of the district extensively for seven years past. It was adopted to obviate the inconvenience of setting fast, so prevalent with the conical metal plug-cocks, and has been found to answer the purpose intended.

"I have recommended its use in several provincial towns with which I am professionally connected, and have not received any complaint of its having failed in any respect of performing satisfactorily all that is required of it.—I am, gentlemen, yours respectfully,

"GEDDIE PEARSE.

"Messrs. Lambert and Son, Lambeth."

25, CHARLOTTE STREET, BLACKFRIARS ROAD, NEAR SURREY CHAPEL.

JOHN WINN

Begs to inform the public that he has had great experience, for many years, as a GAS APPARATUS MANUFACTURER, and, being favoured with a very extensive connection, respectfully invites an inspection of his Stock: it comprises Gas Chandeliers, Pendants, Brackets, Gas Cooking Apparatus, Gas Stoves, and a very simple process of warming Conservatories by gas; and his newly invented Ventilator, suitable for private and public buildings (particularly recommended for invalids' chambers), parlours, taprooms, &c.

☞ J. WINN would also direct attention to his PATENT HORSE SINGER, of which he is the sole manufacturer; patronised by his Royal Highness Prince Albert, and many others too numerous to mention.

PATENT FLEXIBLE GAS TUBING.

JAMES LYNE HANCOCK'S

Vulcanized Indiarubber Hose Pipes and Tubing. Manufactory (and Warehouze), Goswell-mews, Goswell-road, London.

Gas Companies, Engineers, Gas Fitters, and the Trade generally, are respectfully informed this Tubing is now manufactured to any size, from ¼ inch bore and upwards, in 100-feet lengths, and perfectly cylindrical, either with or without a spiral wire inside.

VULCANIZED GLAZED FLEXIBLE TUBING, from ¼ inch up to 1 inch diameter, made in 24-feet lengths; or, covered with silk or worsted, up to 100 feet.

VULCANIZED HOSE, for FIRE ENGINES, BREWERS' USE, and for standing great pressures, (Rubber and Cloth combined), made to any length or size to fit the necessary screws, &c.

VULCANIZED INDIARUBBER AIR-TIGHT BAGS, made any size, for Gas Mains, with flexible tubes attached, and fitted with stopcocks complete.

TO GAS COMPANIES, GAS PROPRIETORS, AND GAS ENGINEERS.

JOHN VICKARY

begs to call the attention of the above to his improved METALLIC CASE GAS-METER, an improvement which has met with entire approbation from the various Gas Companies and Engineers to whom he has introduced it, and acknowledged to be the greatest improvement that has been made since the year 1832; at which period a metal was introduced for the construction of the Drum, Syphon, and Float, capable of resisting any impurities arising from either gas or water, which has been found to answer every expectation; as, in repair, Drums of the above date are found in perfect and good condition, when the Outer Case, Valve-box, Inlet-pipe, &c., are quite destroyed and entirely past repair.

J. V. has introduced a coating or lining of the above metal in the Outer Case, Valve-box, Inlet-pipe, &c., thereby rendering the whole as durable as the Drum, as not a particle of tin plate is exposed to the action of either water or gas; and preventing the possibility of gas passing above the water line through the front into the body of the Case to the outlet unregistered, which frequently occurs. When the Meter has been in use for any length of time it is generally found that rust or decay takes place *above* rather than under the water line, which is only discovered when they need repair. Also the Inlet-pipe and Valve-box are generally found quite decayed, which cannot happen in the above improvement.

J. V. feels confident that the above will be found a most desirable and perfect instrument, as it contains all other improvements of utility that have been introduced up to the present time.

The most strict attention is given to the workmanship as well as the registration of every Meter, to render them perfectly accurate.

Station Meters, Governors, &c., made on the shortest notice, as well as Gas Cooking Apparatus of every description, Gas Baths, &c.

Meters sent at the lowest London prices.

Carriage paid to any part of England.

WEST OF ENGLAND GAS METER AND GENERAL GAS APPARATUS MANUFACTORY, 84, FORE STREET, EXETER

NEW HOUSES OF PARLIAMENT.

DEFRIES'S Gas Stoves, Ranges, and BATHS, in action for two years at the above building. A great variety in stock upon the same principle. Gas Baths from £7, by which a warm bath may be obtained for 1½d. Gas Cooking and Heating Stoves, from £1. Defries's celebrated Dry Gas Meters —upwards of 60,000 in use.

Testimonials at the Office, 145, REGENT-STREET, or at the Manufactory, NEW-ROAD, St. Pancras, near Fitzroy-square.

HARRIS AND PEARSON,
PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.
MANUFACTURERS OF
FIRE BRICKS, GAS RETORTS, &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS,
STOURBRIDGE.
Late in the occupation of I. and W. King.
Originally J. Pidcock, Esq.

JOSEPH BOULTON, Gas Meter Manufacturer, No. 1, COPPICE-ROW, CLERKENWELL, LONDON, begs to call the attention of Gas Companies and the public in general to his improved GAS METER, containing all the latest improvements.

J. B. warrants all Meters to be manufactured of the best materials and workmanship, the wheels, &c., being of metal. Old Meters repaired on the lowest terms.

JOSEPH CLIFF,
WORTLEY FIRE-BRICK WORKS, near LEEDS.

FIRE-CLAY RETORTS, OF ANY SIZE OR SHAPE, SUPPLIED ON SHORTEST NOTICE.

These Retorts are used extensively in the Gas Works of Leeds, Hull, Liverpool, Bradford, Rochdale, and other towns, where they have been tested side by side with those of Stourbridge, Newcastle, and other makes, and proved themselves a superior article.

Eminent Gas Engineers bear testimony that they are the BEST FINISHED AND MOST CORRECT IN FORM of any in the kingdom. Their surfaces are, by the peculiar method of their manufacture, unusually smooth, close, and FREE FROM SURFACE CRACKS; thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surfaces.

To meet the great increase in demand, extensive enlargement of premises and the fitting up of more perfect apparatus have been effected; and gas engineers may rely with confidence on their orders, to any extent, being promptly and satisfactorily executed.

N.B.—FIRE BRICKS, TILES, AND OTHER FIRE GOODS, OF UNEQUALLED QUALITY.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connections, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Borings.

PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas Works, in stock, on wholesale prices, at

LYNCH WHITE'S,
Old Barge Iron Wharf, Upper Ground-street,
LONDON.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, CITY ROAD,
LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, &c.; also Lamp Columns of different patterns.

London Agent, Mr. ALFRED PENNY, Engineer, WENLOCK IRON WORKS, Wharf-road, CITY-ROAD, who undertakes the manufacture and erection of as-holders, purifiers, iron roofs, and every description o apparatus in use in gas works.

BRYAN DONKIN and CO.'s improved GAS VALVES have been adopted by numerous Gas Companies in England and abroad, and their advantages and great security fully proved. Very large numbers are in use. Prices from 11s. to 14s. per inch diameter.

BRYAN DONKIN and Co.,
Engineers, near Grange-road, BERMONDSEY.

GAS MANUFACTURER.

GEORGE BOWER, Vulcan Foundry, ST. NEOT'S, HUNTS, will be glad to prepare Plans, Specifications, and Tenders, for the lighting of Towns, Manufactories, and Private Houses with Gas.

References can be given to both private and public works.

His Patent Combined Apparatus, which forms the Hydraulic Main, Condenser, Scrubber, and Purifier, in one vessel, is especially adapted for works up to 100 lights.

His patent ridged, or rib-bottomed retort is applicable to works of any magnitude, the object of which is to carbonise more rapidly than by the ordinary flat-bottomed retort.

Manufacture of Gasholders, Gas Meters, Gas Cooking and Heating Stoves, and all Apparatus connected with Gas-Lighting.

N.B.—The Combined Apparatus and Retorts will be sold separately, if required.

FRASER AND SANDERSON, INVERKEITHING, manufacture and sell at moderate prices, FIRE BRICKS, GAS RETORTS, SEWERAGE PIPES, and all kinds of best Fire-clay goods. They are the ORIGINAL MAKERS of Fire-clay Retorts, which work from Two to Four years, and are unsurpassed by any others.

PATENT GAS METER MANUFACTORY,
No. 66, Snow-hill, London.

WILLIAM SMITH, by the improvements he has made in the Wet Meter, and which he has secured by her Majesty's Royal Letters Patent, the accuracy of their registry is rendered certain by the introduction of the adjusting slide and hydraulic, whereby a Perfect Water Level is readily obtained, and the Hydraulic precludes the possibility of abstracting water from the meter by increased pressure or otherwise, thus surmounting the great desideratum of the Wet Meter. In his Patent Equitable Gas Meter neatness and strength are combined, the backs and fronts of the case being stamped by powerful machinery out of thick plate iron (tinned or galvanized); and the internal construction is of the best metal, which will resist the action of any impurity in the gas.

Old Meters may readily have the adjusting slide and hydraulic applied, thereby having accurate measurement assured.

Station Meters, Governors, &c., made on the shortest notice.

HULETT AND CO., 55 AND 56, HIGH HOLBORN,
PATENTEES and MANUFACTURERS of the NATIONAL GAS METER,

Beg to inform the Proprietors of Gas Companies, and the Trade generally, that, having completed their new Gas Meter Manufactory, they are now enabled to supply, with despatch, a very superior article, and can confidently warrant the same to be equal in quality and workmanship to any Gas Meter ever made. Manufacturers of

GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, PILLARS, BRACKETS, PENDANTS,
AND EVERY ARTICLE CONNECTED WITH
GAS FITTINGS.
GAS COOKING APPARATUS, IMPROVED ALBERT,
AND EVERY DESCRIPTION OF
SHADOWLESS GAS BURNERS, UNION JETS, BATSWINGS, &c. &c.; CAST AND WROUGHT IRON PIPE; COPPER, TIN, BRASS, and COMPOSITION TUBING.

D. HULETT'S IMPROVED SERVICE CLEANSER,

by which Mains, Service Pipes, and the interior Fittings of a House, may be cleaned out in a few minutes. Price 60s. net.

Sole Manufacturers of Church and Mann's Improved Photometer.

Large Pattern Books, with every description of Gas Fittings and Chandeliers, &c., with complete Book of Prices, price 10s.
Price Lists sent free, on receipt of envelope, addressed and enclosing two postage stamps.

London: Printed by THOMAS GREAVES BARLOW, of 3, Parliament-street, in the parish of St. Margaret, Westminster (at the office of Joseph Clayton, 10, Crane-court, Fleet-street); and published by him at 38 Cheapside, in the parish of St. Mary Cole, in the City of London.—Saturday, February 10, 1855.